Hands On: Construct Parallel and Perpendicular Lines

• D

Construct line k so that k is parallel to a given line h, and passes through point D that is not on line h.

h

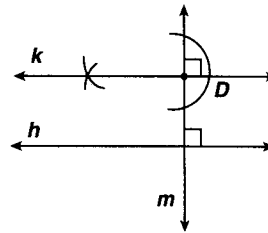
Step ① Construct line m through point D perpendicular to h where D is not on h.
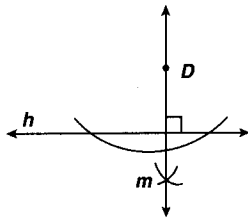
Line h and line m are perpendicular.

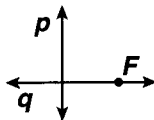**Step ②** Construct line k through point D perpendicular to m where D is on m.
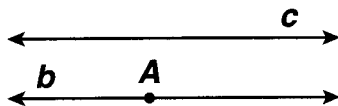
Line h and line k are parallel.

Use a compass for Problems 1–3.

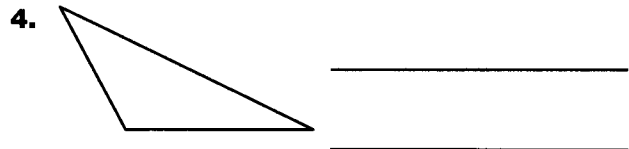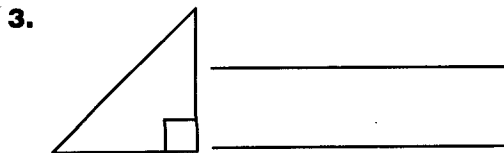1. Draw line p. Label a point F that is not on p. Construct line q so that q is perpendicular to p and passes through F.

2. Draw line b. Label a point A that is on b. Construct line c so that c is parallel to b.

Spiral Review (Chapter 19, Lesson 2) **KEY MG 2.2**

Classify each triangle in two ways.

3. _____
_____

4. _____
_____

5. Jessica is making a design using the shape at the right. Classify the triangle in two ways.

_____
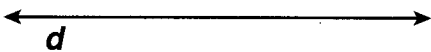
Hands On: Construct Parallel and Perpendicular Lines

Solve.

1. Which line below is parallel to $\overleftrightarrow{CD}$? Is it $\overleftrightarrow{AB}$ or $\overrightarrow{RS}$?

2. Karen said that perpendicular lines form 2 right angles. Dexter thinks Karen meant 4 right angles. Who is correct? Use the figure below to help.

3. Diane is drawing two perpendicular lines. First, she drew line d. What is the next step she should take?

_____

_____

_____

4. Steve is constructing a line parallel to line r. The figure below is what he has drawn so far. What is the next step?

_____

_____

_____

5. Brian drew the figure below. What are the relationships between the line segments?

_____

_____

6. Marie drew this figure using parallel, perpendicular, and intersecting lines. Name the parallel lines.

Hands On: Construct Triangles and Rectangles

CA Standards
KEY MG 2.1, MR 2.0

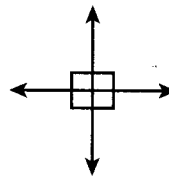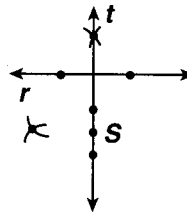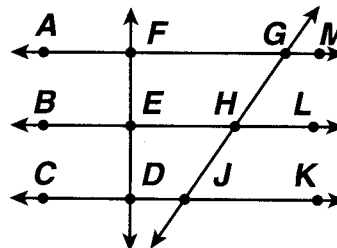Construct a rectangle, *PGHJ*, congruent to rectangle *STRE*.
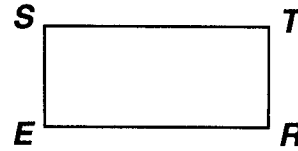
Step ❶ Draw a line and label a point on the line *J*. Measure $\overline{ER}$. Using that measure, draw an arc from *J* and label the point of intersection *H*. Construct two lines that are perpendicular to $\overline{JH}$ at *J* and *H*. Label the points where the arcs intersect the line.	**Step ❷** Using the measure of $\overline{RT}$, draw an arc from *H* and label the point *G*. Draw an arc from *J* and label the point *P*. Draw $\overline{PG}$ to complete rectangle *PGHJ*.
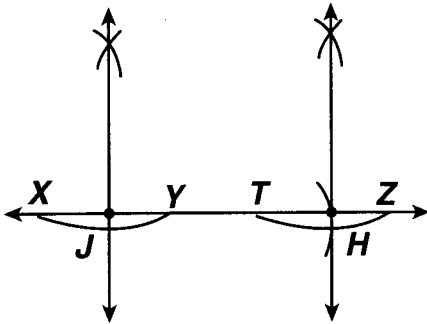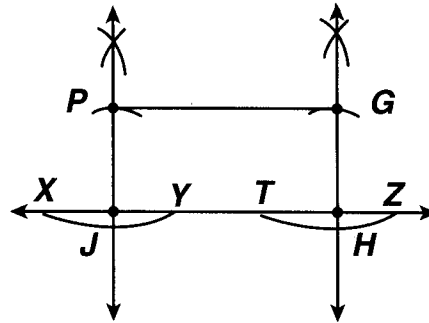
Complete the construction.

1. Construct a rectangle, *LMNP*, congruent to rectangle *DEFG*.
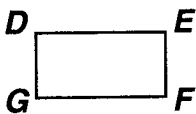
2. Construct a triangle, *RST*, congruent to equilateral triangle *XYZ*.

Spiral Review (Chapter 19, Lesson 2) **KEY** MG 2.2

Classify each triangle in two ways.

3.

_____

_____

4.

_____

_____
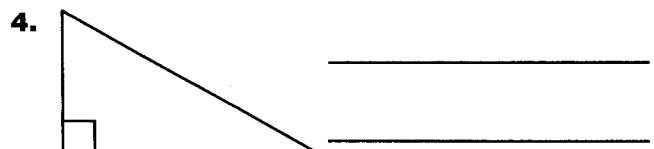
Hands On: Construct Triangles and Rectangles

CA Standards
KEY MG 2.1, MR 2.0

Solve.

1. Are triangles *GHJ* and *XYZ* congruent? Explain.

_____

_____

_____

_____

_____

2. Square *RSTV* has a side length of 4 centimeters and square *ABCD* has a side length of 3 centimeters. George says the two squares are congruent. Is he correct? Explain.

_____

_____

_____
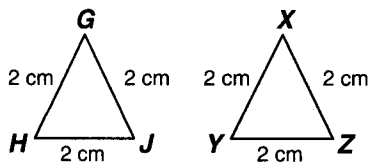
3. Marcus is constructing rectangle *LMNP* congruent to rectangle *ABCD*. What is his first step?

_____

_____

_____

_____
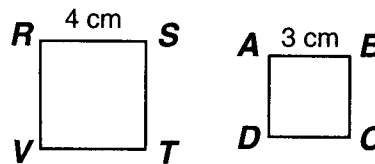
4. Are all equilateral triangles congruent?

_____

_____

5. How could you construct triangle *CHM* if the only measurements you have are the angle measurements of 120°, 30°, and 30°?

_____
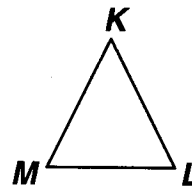
6. Jackie drew triangle *DEF*. Explain how she can construct triangle *TPW* so *TPW* is double the size of *DEF*.

_____

Name _____ Date _____
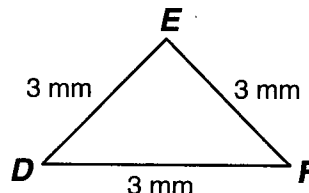
Perimeter and Area of Complex Figures

Find the area and perimeter of the figure.

13.4 cm

7.4 cm

12.4 cm

9.4 cm

5 cm
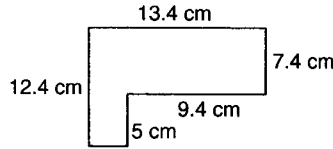
Step ❶ Divide the figure into simple figures. Draw a line that divides the figure into two rectangles.

13.4 cm

7.4 cm

12.4 cm

9.4 cm

5 cm

4 cm
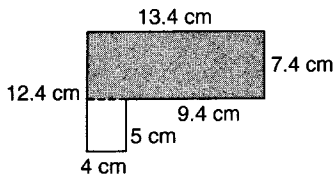
Step ❸ Find the sum of the areas.

$A = 99.16 \text{ cm}^2 + 20 \text{ cm}^2$
$A = 119.16 \text{ cm}^2$

Step ❷ Use the formula to find the area of the rectangles.

large rectangle: $A = lw$
$(13.4) \times (7.4) \text{ cm}^2$
99.16 cm^2

small rectangle: $A = lw$
$(5) \times (4) \text{ cm}^2$
20 cm^2

Step ❹ To find the perimeter of the figure, add the lengths of all the sides.

$P = 13.4 + 7.4 + 9.4 + 5 + 4 + 12.4$
$P = 51.6 \text{ cm}$

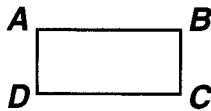**Find the perimeter and area of the figure. All corners are right angles.**
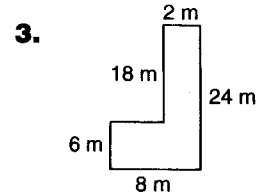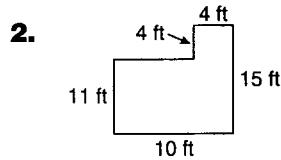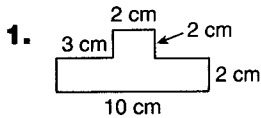
1.
2 cm
3 cm
2 cm
2 cm
10 cm

2.
4 ft
4 ft
15 ft
11 ft
10 ft

3.
2 m
18 m
24 m
6 m
8 m

_____ _____ _____

Spiral Review (Chapter 19, Lesson 2) **KEY MG 2.2**

Classify each triangle in two ways.

4. _____

5. _____
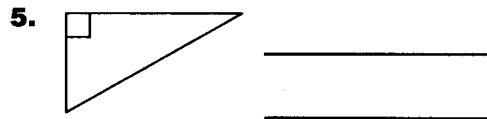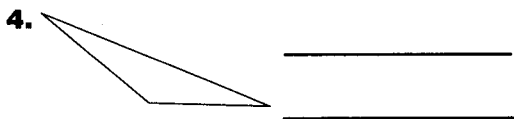
6. The top of a triangular table is shown below. Classify the shape of the tabletop in two ways.

_____

Use with text pp. 436–437

Name _____ Date _____
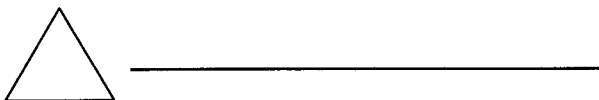
Perimeter and Area of Complex Figures

Solve. All Intersecting lines meet at right angles.

1. Lesli is planting a garden in her backyard. What are the perimeter and area of the garden?

11 ft
4 ft
6 ft
7 ft   2 ft
4 ft

2. Rob is making a sandbox for his younger cousins. What are the perimeter and area of the sandbox?

5 ft   2 ft
4 ft   3 ft
2 ft
8 ft
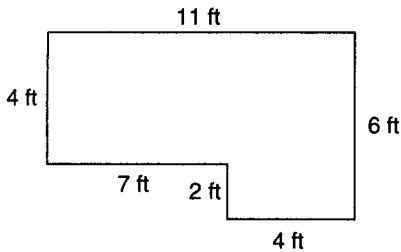
3. Jarrod is ordering stones to cover his patio. What are the perimeter and area of the patio?

13.8 m
9.6 m
4.2 m
9.6 m   5.4 m
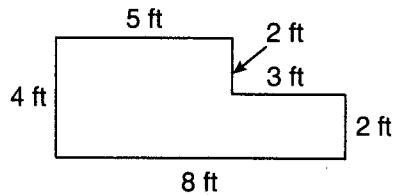
4. Meghan and Kim are laying a new tile floor in Meghan's kitchen. What are the perimeter and area of Meghan's kitchen?

23 ft
16 ft
12 ft
8 ft
11 ft

5. Shannon needs to find out how much carpet to buy for her bedroom. Will she need to find the area or perimeter of her bedroom floor? Explain your answer.

_____

_____

_____

_____

_____

_____
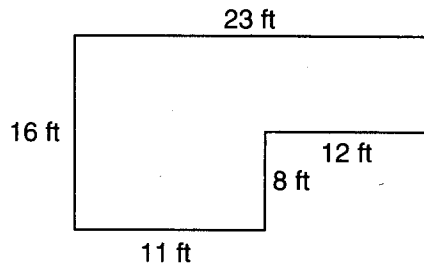
6. Sarita is helping her mother make a flower garden. They need to know how many seeds they will use and how many feet of wooden border to purchase. What are the perimeter and area of the flower garden?

15 m
9 m   7 m
2 m
4 m
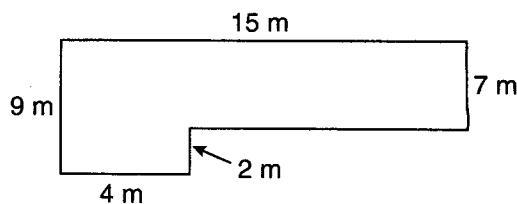
Problem Solving:
Multistep Problems

The figure shows the dimensions of a countertop that Paul has designed for his kitchen. The granite needed for his countertop costs $35.75 for 5 m². How much money will Paul spend on granite for his countertop?

2 m

3 m

10 m

11 m

8 m

12 m
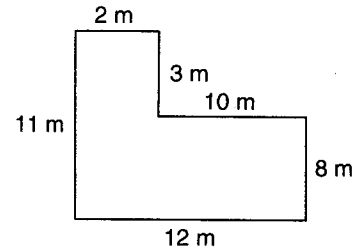
Step ❶ Divide the complex figure.

Step ❷ Find the area.
Area of Rectangle 1:
$A = l \times w$
$= 12 \text{ m} \times 8 \text{ m}$
$= 96 \text{ m}^2$
Area of Rectangle 2:
$A = l \times w$
$= 2 \text{ m} \times 3 \text{ m}$
$= 6 \text{ m}^2$
Find the sum of the areas to find the area of the entire countertop.
$A = 96 \text{ m}^2 + 6 \text{ m}^2$
$= 102 \text{ m}^2$

Step ❸ Find the cost of the granite.
5m² costs $35.75.
102 m² ÷ 5 m² = 20.4, or about 21
21 × $35.75 = $750.75

Solve. Explain why your answer makes sense.

1. Leslie is making the sign shown. She has enough paint to cover 40 ft². Is that enough paint to cover the front of the sign?

1 ft   1 ft

1 ft   1 ft

5 ft

6.5 ft   6.5 ft

7 ft

_____

_____
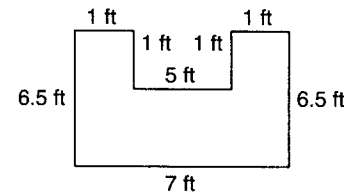
Spiral Review (Chapter 19, Lesson 2) **MG 2.0, KEY MG 2.2**

Classify each triangle in two ways.
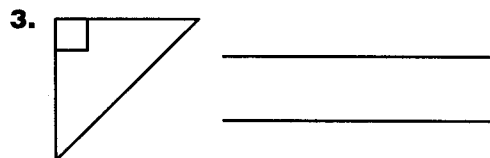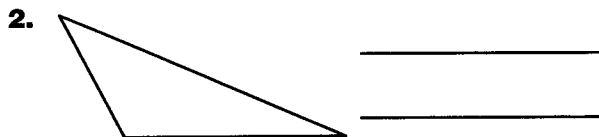
2. _____

_____

3. _____

_____

Name _____ Date _____

Problem Solving:
Multistep Problems

Solve. Explain why your answer makes sense.

1. The area of a wall is 52 ft². A can of paint that will cover 13 ft² costs $9.98. How much will paint cost to cover the wall?

$52 \div 13 =$ _____

_____ $\times 9.98 =$ _____

2. The perimeter of a complex figure is 128 m. Kelsey wants to place lighting around the border of the figure. She can buy the lighting in strands of 8 m. How many strands of lighting does she need to buy?

_____

_____

3. What is the area of the sandbox shown below?

5.2 ft

3.5 ft

5.8 ft

3.5 ft

2.3 ft

1.7 ft

4. Use the figure in Problem 3. Tony wants to place a fence around the sandbox. A roll of fencing is 4 feet long. How many rolls of fencing should he buy?

_____

5. The grass in Jenna's lawn has not grown in too well. She plans to throw more seed onto her lawn. A 1-lb bag of seed costs $22 and covers 60 m². A 5-lb bag of seed costs $88 and covers 300 m². How much will Jenna spend on grass seed for her lawn?

29.8 m

15 m

15 m

30.5 m

15.5 m

14.8 m

6. Use the figure in Problem 5. Jenna wants to build a fence around her yard. She has 75 meters of fence. How many more meters of fence does she need to buy?

_____

_____

_____

Hands On: Area of Parallelograms

Find the area of the parallelogram shown.
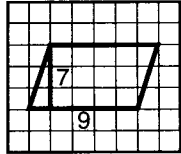
Step 1 Copy the parallelogram. Draw the height *h* to make a triangle. Shade the triangle shape on the end of the figure. Cut out the triangle.
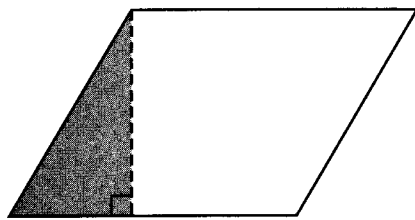
Step 2 Move the cut-out triangle to the other side of the parallelogram and tape it in place to form a rectangle. Determine the height and length of the rectangle and multiply together.

A = 9 cm × 7 cm
A = 63 cm²
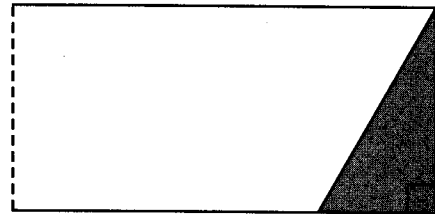
Copy each parallelogram onto centimeter grid paper. Draw a line perpendicular to the other side to make a triangle. Cut out each parallelogram. Then cut off the triangular piece. Make the parallelogram into a rectangle.

1. 7 cm / 12 cm

2. 5 cm / 3 cm

3. 4 ft / 20 ft

_____ _____ _____

Spiral Review (Chapter 16, Lesson 4) AF 1.1

Kim's Allowance Spending

5%
35%
45%
15%

■ savings
▨ movies
□ food
□ clothes

Use the information from the graph to solve the problems.
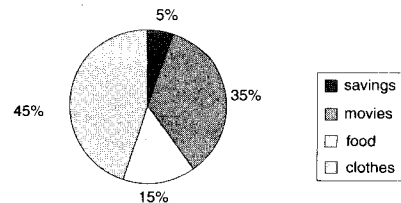
4. Is more money spent on movies or clothes?

5. Which two categories make up half of Kim's spending?

Area of Parallelograms

Find the area of the parallelograms in 1 & 2.

1.

h (height) = 2 cm

b (base) = 3 cm

_____

2.

h (height) = 3 in.

b (base) = 9 in

_____
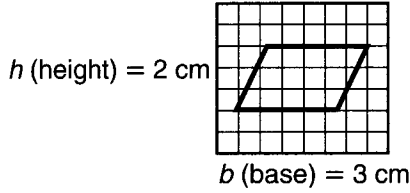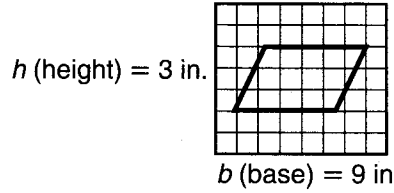
Draw each parallelogram on the grids provided. Label the base and height. Find the area of each parallelogram.

3. $b = 7$ cm; $h = 3$ cm

_____
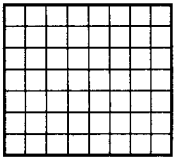
4. $b = 6$ ft; $h = 10$ ft

_____
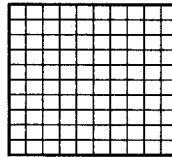
5. If a parallelogram has an area of 91 ft^2 and its height is 7 ft, what is the length of its base? Explain.

_____

_____

6. A parallelogram has a base of 22 ft and a height of 15 ft. Is the area of that parallelogram greater than, less than, or equal to the area of a rectangle with a length of 15 ft and a width of 22 ft? Explain.

_____

_____

_____

_____

Name _____ Date _____

Area of Parallelograms

A = bh
= 8.5 × 4
= 34

The area is 34 square centimeters or 34 cm².

4 cm

8.5 cm

Find the area of each figure.

1.
5 m   6 m
12 m

2.
2 m
8 m
6 m

3.
3 ft   4 ft
15 ft

4.
9 m   10 m
12 m

5.
8 yd
13 yd

6.
5 in.
8 in.   10 in.
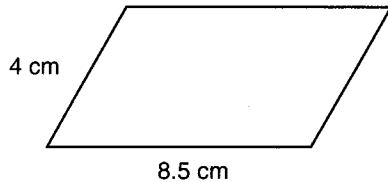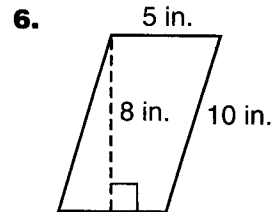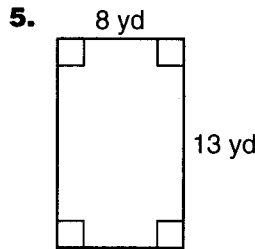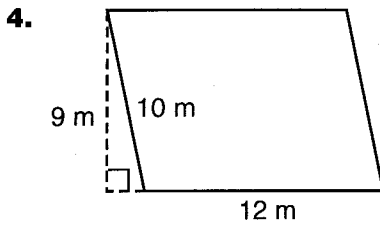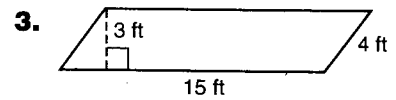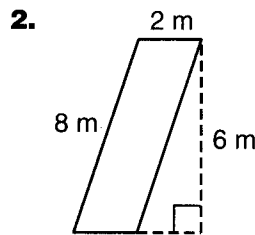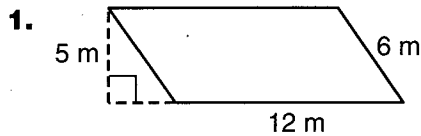
Spiral Review (Chapter 16, Lesson 4) **AF 1.1**

Use the information from the graph to solve the problems.

7. Which two subjects does Don spend the same amount
of time on?

Don's Time Spent on Homework

10%   10%
25%
55%

■ math
▨ reading
□ science
■ social studies

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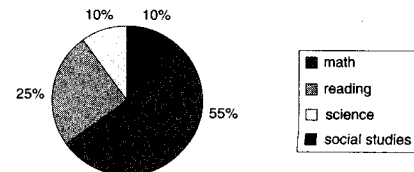
8. Which subject takes up more than half of his homework time?

Area of Parallelograms

Solve problems 1–6.

1. If the base of a parallelogram measures 14 cm and the height measures 9 cm. What is the area of the parallelogram?

2. Brittany is designing a mural in the shape of a parallelogram. The base of the parallelogram will be 21 feet and the height will be 10 feet. The art teacher needs to know the area of the mural so she can get Brittany enough paint. What is the area of the mural?

3. The area of a parallelogram is 153.6 in². The base measures 19.2 inches. What is the measurement for the height of the parallelogram?

4. The area of a parallelogram is 1,228.15 in². If the height measures 60.5 inches, what is the measurement of the base of the parallelogram?

5. Janae's backyard is in the shape of a parallelogram. The area of Janae's backyard is 175.2 ft². She goes to the store to buy grass seed and discovers that each bag of seed costs $32.89 and covers 15 ft². How many bags of seed will Janae need in order to cover her backyard in grass seed?

6. Use problem 5. As Janae is loading the bags of grass seed into her car a bag opens and spills all over the parking lot. She estimates that she lost seed for 8 ft². How much area will her remaining bags cover? How many more bags will she need to buy?

Leveled Problem Solving

192

Use with text pp. 454–456

Name _____   Date _____

Hands On: Area of Triangles

CA Standards
KEY MG 1.1, MG 1.0

Use a parallelogram to find the area of a triangle.

Step 1 Find the area of the parallelogram.

h

b
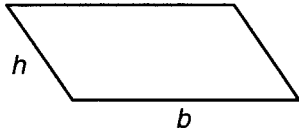
$b = 4$ cm
$h = 2$ cm

$A = bh$

$A = 4 \times 2 = 8$ cm²

Solution: The triangle has an area of 4 cm².

Step 2 Make two triangles and find the area. A line from a vertex to the vertex opposite it makes two equal triangles.

The area of a triangle is one half the area of a parallelogram.

So, $A = \frac{1}{2}(b \times h)$ or $A = \frac{1}{2}bh$.

Make two copies of each triangle on the same piece of grid paper. Cut out one copy. Place it besides the uncut copy to make a parallelogram. Find the area of the parallelogram. Find the area of the triangle.

1.

5 m h

5 m

2.

h 3 cm

12 cm

3.

16 m h

8 m

_____   _____   _____

_____   _____   _____

_____   _____   _____
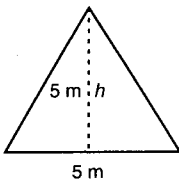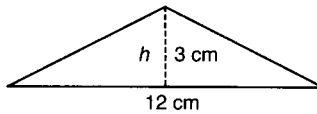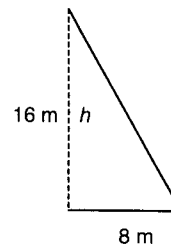
Spiral Review   (Chapter 20, Lesson 3) **MG 1.0**

Find the perimeter and area of each figure.

4.

6 ft
4 ft
5 ft   2 ft
1 ft
8 ft

5.

20 cm
4 cm   3 cm
6 cm
14 cm   1 cm

_____   _____

_____   _____
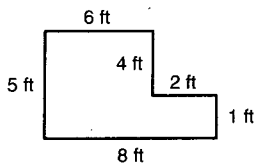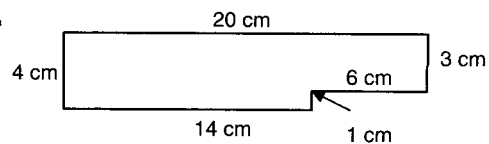
Name _____ Date _____

Hands On: Area of Triangles

CA Standards
KEY MG 1.1, MG 1.0

Solve problems 1–6.

1. If the base of a parallelogram measures 5 cm and the height of the parallelogram measures 6 cm, what would be the area of one of the triangles? Use the parallelogram below to aid in finding the area of the triangle.

6
5

_____

2. What is the area of a triangle with a base of 12 ft and a height of 6.5 ft? Use the parallelogram below to help find the area.

6.5
12

_____
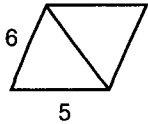
3. The area of a triangle is 18 cm². If the base of the triangle is 4 cm, what would be the measurement of the height? Draw the triangle on the grid below to help.

_____
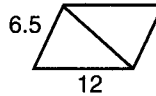
4. The base of a triangle is the same as its height. What are the least whole number measurements for the triangle so that the area would be greater than 144 ft²?

_____

5. Katie made a kite by sewing two congruent triangles together to form a parallelogram. The base of each triangle is 13 in. and the height is 6 in. What is the area of Katie's kite?

_____

6. Katie also made a kite out of 4 congruent triangles which when sewn together make two parallelograms. The base of each triangle is 7.3 cm and the height is 9 cm. What is the area of Katie's kite?

_____

Name _____ Date _____

Area of a Triangles

> **Find the area of a triangle with a base of 8 cm and a height of 6 cm.**
>
> $A = \dfrac{1}{2} \times b \times h$ $\qquad$ $A = \dfrac{1}{2} \times 8 \times 6$ $\qquad\qquad$ $A = 24$ cm²

Find the area of each triangle.

1.

8 ft   9.43 ft

5 ft

_____

2. 2 m
8 m

_____

3.

9 cm

14 cm

_____

4.

12 yd

30 yd

_____

5.

8 m

4 m

_____

6.

4 ft

10 ft

_____
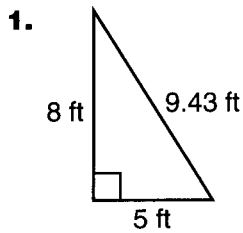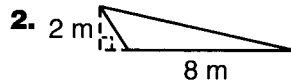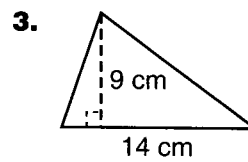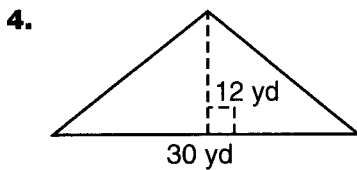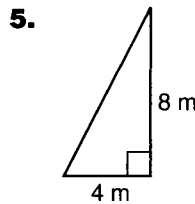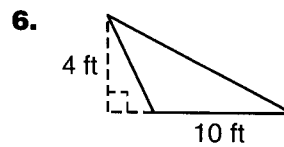
Spiral Review (Chapter 20, Lesson 3) **KEY NS 2.1**

Find the area of each figure

7.

9 in

13 in   7 in

_____

8.

7 m

16.2 m   5 m

_____
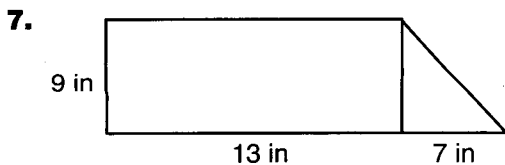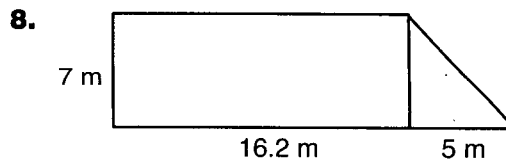
9. An artist is making a giant rectangular mural for a high school gym. The rectangle will have a 43-foot base. If the mural will be 16 feet tall, how many square feet of wall space will the mural use?

_____

Area of Triangles

Solve problems 1–6.

1. The teachers at Jefferson Elementary handed out triangle-shaped pennants on the first day of school. If each pennant has a base of 5 inches and a height of 12 inches, what is the area of each pennant?

2. On the first day of school, students also received a triangle locker tag. If the base of the triangle is 4 in. and the height is 6 in., what is the area of the locker tag?

3. The high school also sells a small pennant. If the small pennant has a height of 24 inches and the area is 108 square inches what is the length of the base of the pennant?

4. A triangle has a base of 8 feet and a height of 6 feet. Beatrix says the area of the triangle is 48 square feet. Explain what Beatrix's mistake was. Then tell the correct answer.

5. How are the area formulas of triangles and parallelograms alike? How are they different?

6. At football games, the local high school sells large pennants. If each pennant has a base of 1 foot and height of 2.5 feet, what is the area of each pennant in square inches?

Hands On: Make Solids Using Nets

Karen is making pieces for a board game. Which type of net is she using?

Step ❶ Copy the net. Then cut it out.
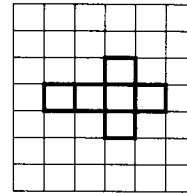
Step ❷ Fold the net on the dotted lines. Tape the edges together.
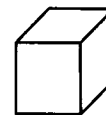
Solution: Karen is using a net for a cube to make the game pieces.

Predict whether the net forms a rectangular prism, a cube, or neither. Then copy the pattern onto grid paper, cut it out, fold it, and tape it together to check your prediction.
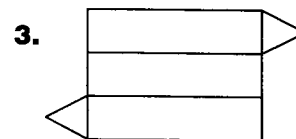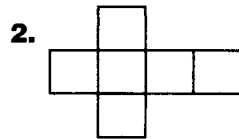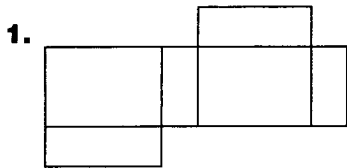
1. _____

2. _____

3. _____

Spiral Review (Chapter 19, Lesson 3) **KEY** MG 2.2

Classify each figure in as many ways as possible. Then find the missing angle measures.

4. ? / 6 in. / 12 in.

_____

_____
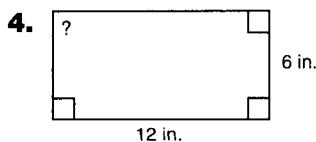
5. Jessica is making a design using the shape below. Classify the figure in two ways.

120° / ?
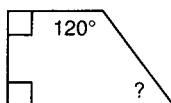
6. Julio is making a tabletop in the shape shown below. What shape is this? What is the missing angle?

?

_____

_____
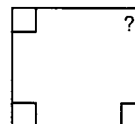
Hands On: Make Solids Using Nets

CA Standard
KEY MG 1.2

Solve problems 1–6.

1. Nicky has to fold this box. When Nicky folds this box, what shape will be formed?

_____

2. Ray drew this net. What shape will this net form?

_____
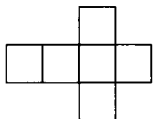
3. This net has 4 large rectangles and 2 small rectangles. Which solid figure will it form?

_____
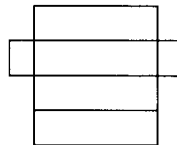
4. Ellis drew this net for a cube. Explain his mistake. Then tell what the net should look like.

_____

_____

_____

_____

5. Draw a net for a square pyramid. What shapes are needed to form this figure?

_____

_____
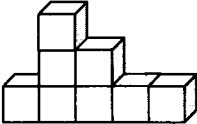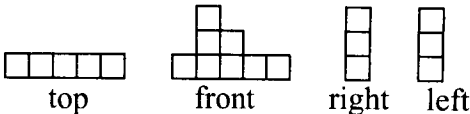
6. Ken ate a bowl of cereal for breakfast. Draw the net that would form a box of cereal.

Name _____ Date _____

Hands On: Draw Views of Solid figures

CA Standards
MG 2.3, MG 2.0

Blocks	Views
	top front right left

Use cubes to build each figure. Then draw a top view, a front view,
a right side view, and a left side view of the figure on grid paper.

1.

2. _____
_____
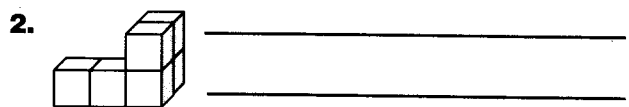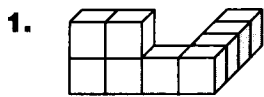
Draw the figure for each set of views.
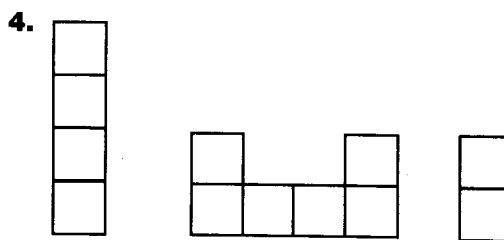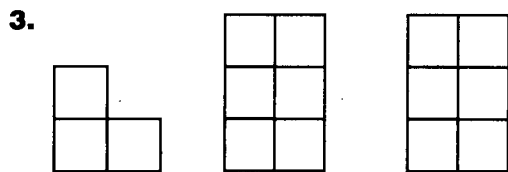
3.

4.

Spiral Review (Chapter 19, Lesson 3) **KEY** MG 2.2

Classify each figure in as many ways as possible. Then find the
missing angle measures.

5. ?
130°

6. 110°   ?
70°   110°   _____
_____
_____

_____
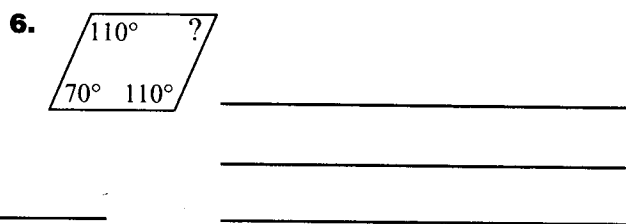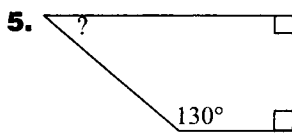
7. Susanna is making a quilt and cut this shape out of fabric.
What is the shape? What is the missing angle?

12 cm
?
12 cm

_____

_____

Hands On: Draw Views of Solid Figures

Solve problems 1–6.

1. What is the front view of this figure?
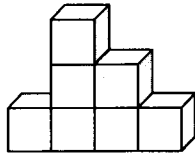
2. What is the top view of this figure?
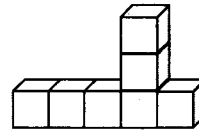
3. Draw the front, top, right side, and left side view of the figure.
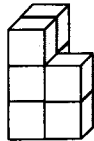
front   top   right side   left side

4. Draw a three-dimensional figure using these views.
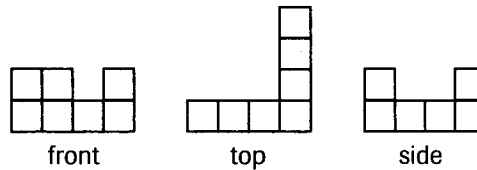
front   top   side

5. Combine the two figures below. Then draw a front, top, and side view of your new figure.
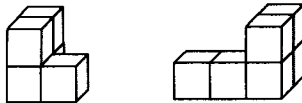
6. Mr. Donald built a staircase that measured 3 cubic units wide and has a height of 5 cubic units. Draw a sketch of the staircase.

Name _____ Date _____

Surface Area

What is the surface area of the box?

4 inches
10 inches
12 inches

12 in.
4 in.
12 in.
12 in.
10 in.
12 in.
12 in.
10 in.
10 in.
4 in.
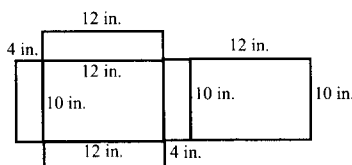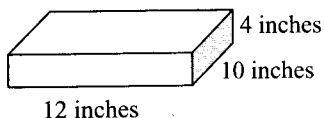
Step ❶ Find the number of faces on the rectangular prism.

Step ❷ Complete the table to find the area of each face.

Face	Length	Width	Area	Face	Length	Width	Area
top	12	10	120 in²	left side	10	4	40 in²
bottom	12	10	120 in²	right side	10	4	40 in²
front	12	4	48 in²			**sum:**	416 in²
back	12	4	48 in²				

Add the areas to find the surface area.

Solution: The surface area is 416 in².

Predict what solid figure each net will make. Then find the surface area of the figure.
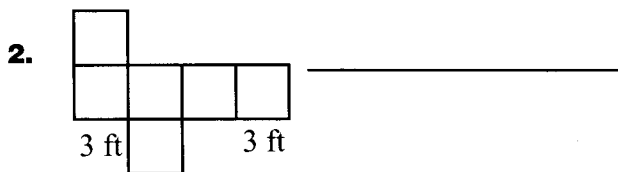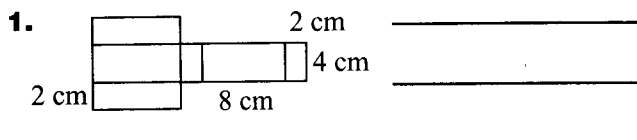
1.
2 cm
4 cm
2 cm
8 cm

_____
_____
_____

2.
3 ft
3 ft

_____

Spiral Review (Chapter 19, Lesson 3) **KEY** MG 2.2

Classify each figure in as many ways as possible. Then find the missing angle measures.

3.
11 in.
100° 80°
80° ? 5 in.

4.
9.2 cm
7.2 cm
?

_____
_____

_____
_____
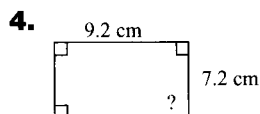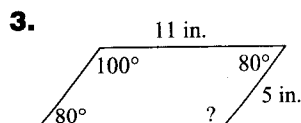
5. Bill is tiling the floor in his bathroom with tiles like this one. What is the shape of this tile? What is the missing angle?

15 cm
?
15 cm

_____

_____

Name _____ Date _____
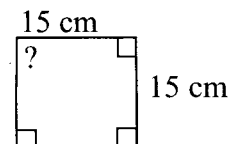
Surface Area

Solve problems 1–6.

1. Tina's jewelry box is in the shape of a rectangular prism. What is the surface area of Tina's jewelry box? **HINT:** A rectangular prism has 6 faces.

15 cm
10 cm
8 cm

2. Grace's pencil box has a height of 4 in., a length of 11 in., and a width of 6 in. What is the surface area of the pencil box?

4 in.
6 in.
11 in.

3. The puzzle that Jerry got for his birthday was in a box with a length of 15 in., a width of 8 in., and a height of 3 in. What is the surface area of the box?

3 in.
8 in.
15 in.
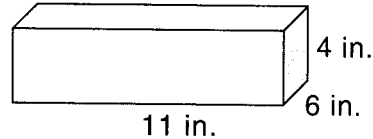
4. Jerry received another present that was 15 in. long, 7.5 in. wide, and 6 in. high. Is the surface area of this box greater than or less than the surface area of the box in Problem 3?

6 in.
7.5 in.
15 in.

5. David stacked two boxes together as shown below. Each box measured 10 in. long, 5 in. high, and 3 in. wide. What is the exposed surface area of both boxes?

5 in.
5 in.
3 in.
10 in.
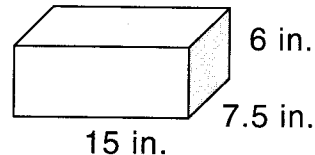
6. Compare the surface area of Box A and Box B using >, <, or =.

Box A
5 in.
3.2 in.
7.5 in.

Box B
8.5 in.
4 in.
4.5 in.
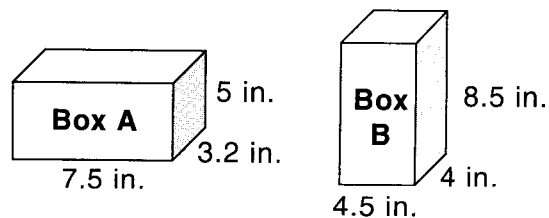
Volume

Find the volume of the box.

5 in.
3 in.
12 in.
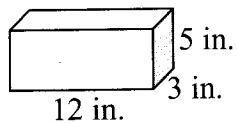
$V = l \times w \times h$
$= 12 \text{ in.} \times 3 \text{ in.} \times 5 \text{ in.}$
$= 180 \text{ in}^3$

Solution: The volume is 180 in³.

Find the volume of each solid figure.

1.

10 m
10 m
10 m

2.

3 m
8 m
7 ft

3.

3 in.
10 in.
8 in.

_____

_____

_____
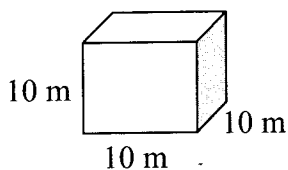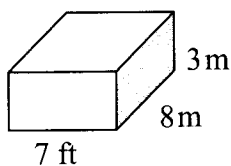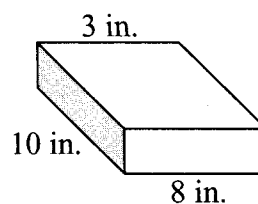
Spiral Review (Chapter 21, Lesson 2) **KEY MG 1.1, MG 1.0**

Find the area of each figure.

4.

12 in.
4 in.

5.

7.2 ft
9.8 ft

_____

_____
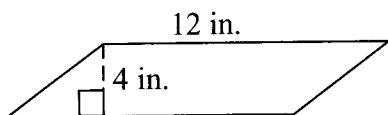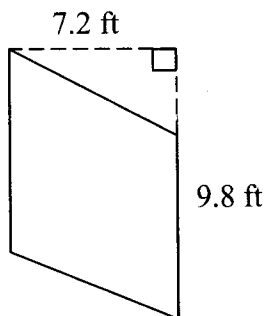
6. Paul cut a rectangular piece of cardboard that measured 11 inches in length and 8 inches in width. What was the area of the piece of cardboard?

_____

Volume

Solve problems 1–6.

1. Paula built this figure out of blocks. What is the volume? **HINT:** Count the blocks to find the length, width, and height.
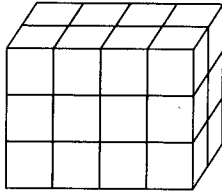
2. Simon built the figure below using cubes. What is the volume?
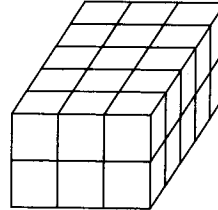
3. A rectangular swimming pool has length of 35 m, a width of 20 m, and a depth of 6 m. What is the volume of the pool?

6 m
20 m
35 m
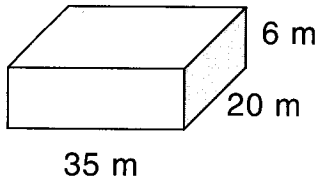
4. Find the volume of the swimming pool below. What is the difference in volume between this swimming pool and the swimming pool from Problem 3?

4.5 m
20 m
35 m
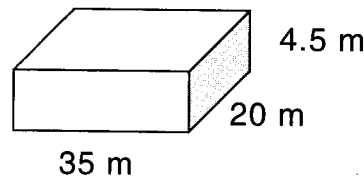
5. The volume of the fish tank below is 2,880 in³. The length and width are labeled. What is the height?

? in.
10 in.
24 in.
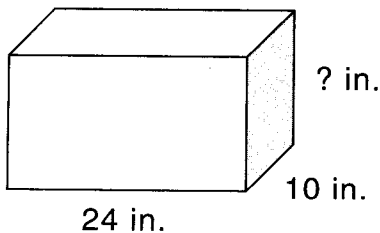
6. Kevin's pencil box measured 28 cm in length, 20 cm in width, and 12 cm in height. Draw the pencil box. Then, find the volume.

Perimeter, Area, or Volume?

Solve. Tell whether you found perimeter, area, or volume.

Henry built a jewelry box for his mother using the pattern shown. How much fabric does he need to cover the top and sides?
Now he needs to use what he knows about surface area, volume, and perimeter to finish his present.
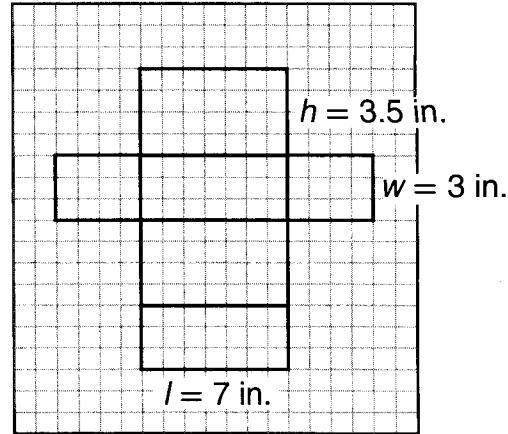
Henry needs to find the surface area without the bottom.

Remember, $A = l \cdot w$.
top face: 21 in.^{2}
front and back faces: $2 \times (24.5$ in.$^2) = 49$ in.^{2}
side faces: $2 \times (10.5$ in.$^2) = 21$ in.^{2}
Solution: 21 in.^{2} + 49 in.^{2} + 21 in.^{2} = 91 in.^{2}

$h = 3.5$ in.

$w = 3$ in.

$l = 7$ in.

1. How much will the jewelry box hold?

_____

2. Henry wants to glue a photo of his family on the top face of the jewelry box. The photo has a length of 5 inches and a width of 3 inches. How much fabric is showing on the top face after the photo is glued on? HINT: Subtract the area of the photo from the area of the top face of the jewelry box.

_____

Spiral Review (Chapter 21, Lesson 2) **KEY MG 1.1, MG 1.0**

Find the area to solve.

3.
7.5 cm

13 cm

4.

28 m

14 m
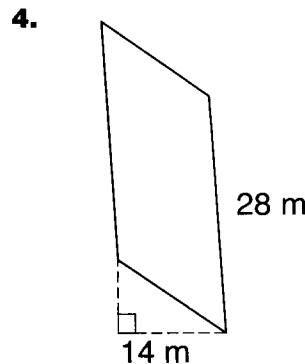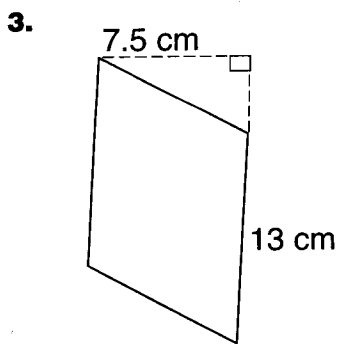
5. Jermaine drew this picture of his backyard. What is the area?
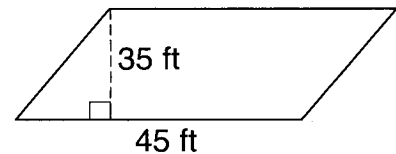
35 ft

45 ft

_____   _____   _____

Perimeter, Area, or Volume?

Solve. Tell whether you found perimeter, area, or volume.

1. Jackie needs enough wrapping paper to cover this entire box. How much wrapping paper will she need? **Hint:** Find the area of each face and add them together.

$l = 12$ in.

$w = 9$ in.

$h = 3$ in.
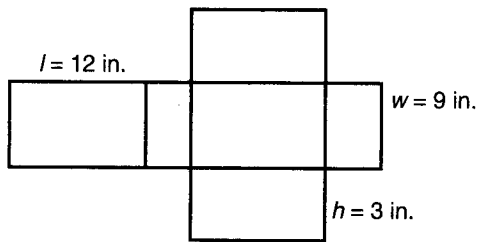
2. A cabinet stands 6 ft tall, 4 ft in length, and 2 ft in width. How many cubic feet of space is available in the cabinet? **Hint:** Volume $= L \times W \times H$

$w = 2$ ft

$h = 6$ ft

$l = 4$ ft
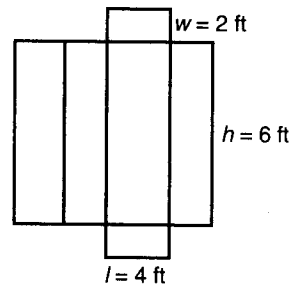
3. Abby bought a plastic storage container that measures 36 inches in length, 20 inches in width, and 24 inches in height. A strip of rubber was placed around the edges of the top of the container. How much rubber was used?

4. Rose's grandmother gave her a jewelry box for her birthday which is 18 cm long, 10 cm wide and 12.8 cm deep. Use the measurements of the jewelry box to find how many cubic cm are inside.
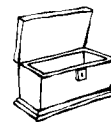
5. Mike's house has three bedrooms. Each bedroom has a closet. The closet in the first bedroom measures 5 ft in length, 3 ft in width, and 7 ft in height. The closet in the second bedroom measures 5 ft in length, 4 ft in width, and 7 ft in height. The closet in the third bedroom measures 5 ft in length, 8 ft in width, and 7 ft in height. How much space is in all three closets combined?

6. Mr. Montgomery's science class is making dioramas out of shoe boxes. The 24 students are covering their shoe boxes with construction paper. They can not cover the front face. The length of each shoebox is 12 in., the width is 8 in., and the height is 6 in. How much paper is needed to cover all 24 students' shoe boxes?

Name _____ Date _____

Hands On: Model Percent

CA Standards
KEY NS 1.2, MR 2.3

Write the percent of the grid that is shaded. Then write a decimal and
a fraction in simplest form for the shaded part.

Step ❶ Write the percent shown by the shaded squares.
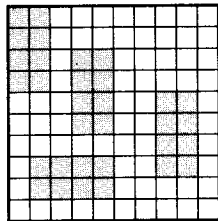
32% is shaded.

Step ❷ Write the percent as a decimal and a fraction.

$$32\% = 0.32$$
$$32\% = \frac{32}{100} = \frac{8}{25}$$
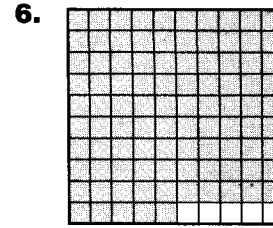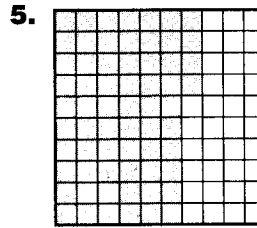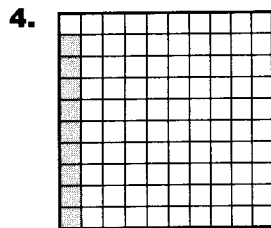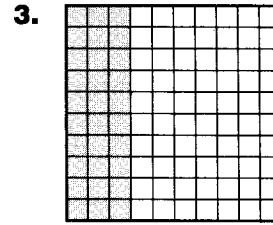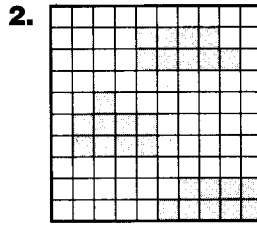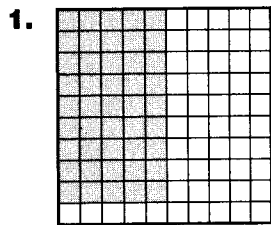
---

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Spiral Review (Chapter 1, Lesson 4) NS 1.3, **KEY** NS 1.4

Write using exponents. Then write the value of the expression.

7. $5 \times 5 \times 5 \times 5$ _____

8. 9×9 _____

9. The volume of a cube equals the length times the width times the height. Express the volume of a cube with side length 2 units using an exponent. Then write the value of the expression.

_____

Name _____ Date _____

Hands On: Model Percent

Solve.

1. Tony shaded some of the squares on this hundreds grid. What fraction of squares did Tony shade? What percent of squares did Tony shade?

_____

_____

2. Marita spelled 84 out of 100 words correctly on her spelling test. Shade the hundreds grid below to show Marita's score. What percent of the words did Marita spell correctly?

_____
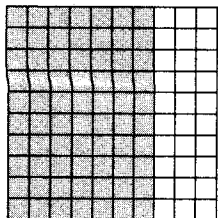
3. There are 20 students in Jarrod's karate class. Six of the students are in third grade. Write the number of third grade students as a percent, a decimal, and as a fraction.
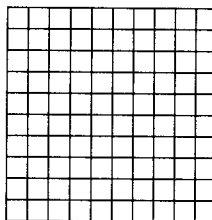
4. Mrs. McCarthy asked George and Sarah to show 0.40 on hundreds grids. Who shaded their grid correctly?

George   Sarah

5. In the election for class president, Daphne received 40% of the votes, Felicia received 35% of the votes, and Chet received the rest of the votes. What percent did Chet receive?
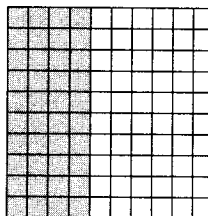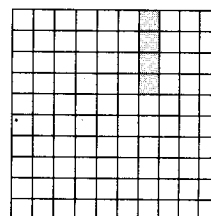
6. Roland bought a packet of sunflower seeds for his garden. On Saturday, he planted 65% of the seeds. How many seeds does Roland have left to plant? Write your answer as a percent, a decimal, and as a fraction.

Relate Percents to Fractions and Decimals

Write $\frac{4}{5}$ as a percent.

Way 1 Use equivalent fractions. Write an equivalent fraction with a denominator of 100. **Think:** 5 times what number equals 100? $\times 20$ $\frac{4}{5} = \frac{80}{100}$ $\times 20$ Write the fraction as a percent. $\frac{80}{100} = 80\%$ **Solution:** Both ways show that $\frac{4}{5} = 80\%$.	**Way 2** Use division. Divide the numerator by the denominator. $\frac{4}{5} = 5)\overline{4.0}^{\,0.8}$ Write the decimal as a percent. $0.8 = 0.80 = 80\%$

Find the percent by finding an equivalent fraction or dividing the numerator by the denominator.

1. $\frac{1}{20}$ _____

2. $\frac{3}{10}$ _____

3. $\frac{2}{5}$ _____

4. $\frac{7}{50}$ _____

5. $\frac{14}{20}$ _____

6. $\frac{15}{50}$ _____

7. $\frac{17}{20}$ _____

8. $\frac{23}{50}$ _____

9. $\frac{54}{100}$ _____

10. $\frac{11}{20}$ _____

11. $\frac{14}{25}$ _____

12. $\frac{3}{15}$ _____

Spiral Review (Chapter 1, Lesson 4) NS 1.3, **KEY** NS 1.4

Write using exponents. Then write the value of the expression.

13. $6 \times 6 \times 6 \times 6$ _____

14. $7 \times 7 \times 7 \times 7 \times 7 \times 7$ _____

15. Eight large boxes each contain 8 small boxes. Each small box weighs 8 ounces. Express the total weight of the small boxes using an exponent. Then evaluate.

_____

Relate Percents to Fractions and Decimals

Solve.

1. At basketball camp, Cheryl was in a free throw competition. She attempted 10 shots and made 6 of them. What percent of free throws did Cheryl make? Write your answer as a percent and a decimal.

$$\frac{6}{10} = \text{\_\_\_\_} \% = \text{\_\_\_\_}$$

2. There were 45 students signed up for camp. Of those students, 18 were in third grade. What percent of students who signed up for camp were in third grade? Write your answer as a percent and as a decimal.
(HINT: First, simplify the fraction. Then find the percent and decimal.)

$$\frac{18}{45} = \text{\_\_\_\_} \% = \text{\_\_\_\_}$$

3. The Houston Comets had the second-best record in the WNBA during the 2002 season. The Comets won 24 of their 32 games. What percent of their games did the Comets win?

_____

4. Suppose that a basketball player attempted 20 three-point shots and made 5 of them. Write the number of shots that she made as a percent and as a decimal.

_____

5. There are 25 students practicing soccer. Nine of the students are girls. What percent of the students are girls? What percent of the students are boys?

_____

6. Tony made 85% of his field goal attempts. If he made 40 attempts, how many field goals did he make?

_____

Compare and Order Fractions, Decimals, and Percents

Compare $\frac{7}{10}$, 46%, and 0.63 to find the greatest.

Step **1** Rewrite the fraction as a decimal.	Step **2** Think of the percent as a number of hundredths.	Step **3** Compare.
$\begin{array}{r} 0.7 \\ 10\overline{)7.0} \\ -7.0 \\ \hline 0 \end{array}$	$46\% = \frac{46}{100} = 0.46$	$0.7 > 0.63 > 0.46$

Solution: $\frac{7}{10}$ is the greatest.

Which is greatest?

1. $\frac{3}{5}$ 0.56 55%

2. $\frac{3}{8}$ 0.38 35%

3. $\frac{2}{9}$ 0.25 24%

_____

_____

_____

4. $\frac{8}{11}$ 0.7 71%

5. $\frac{6}{7}$ 0.4 86%

6. $\frac{2}{3}$ 0.62 65%

_____

_____

_____

Which is least?

7. $\frac{1}{10}$ 0.11 19%

8. $\frac{7}{10}$ 0.63 47%

9. $\frac{3}{4}$ 0.71 73%

_____

_____

_____

Spiral Review (Chapter 21, Lesson 4) **MG 1.0, KEY MG 1.1**

Find the area of each figure.

10.

6 cm

5 cm

11.

5 cm

8 cm
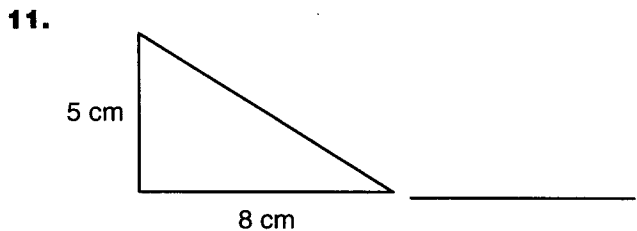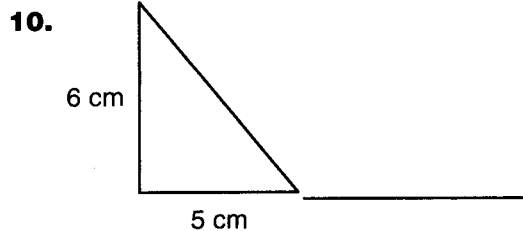
12. A triangular flag has a base of 20 inches and a height of 32 inches.

What is the area of the flag? _____

Compare and Order Fractions, Decimals, and Percents

Solve.

1. About 35% of the people who come to the park bring a dog. $\frac{2}{5}$ of people who come to the park exercise. Which group of people represents a larger percent of the people coming to the park?

2. Heavy rains fell on 52% of the country on Monday and $\frac{12}{25}$ of the country on Tuesday. On which day did a greater portion of the country receive rain?

3. In a survey of favorite ice cream, mint chocolate chip received 22% of the votes. Chocolate received $\frac{1}{4}$ of the votes and vanilla received 0.37 of the votes. Order the flavors from most to least popular

4. Mr. Davis's students were surveyed on their favorite subject. One fifth prefer math, 0.35 prefer social studies, and 45% prefer reading. Order the subjects from least favorite to most favorite.

5. Bart conducted a music survey among his friends. He reported that 0.42 prefer pop, 22% prefer rock, and $\frac{2}{5}$ prefer country. Explain what's wrong with Bart's results.

6. Forty percent of the students in Mrs. Henry's fourth grade class are 9 years old. Another 0.25 are 10 years old, and the rest of the class is 11 years old. Write the number of students that are 11 years old as a fraction, decimal, and percent.

Percent of a Number

Find 25% of 60.

Way ❶ Write the percent as a fraction.

$25\% = \frac{25}{100} = \frac{1}{4}$

$\frac{1}{4} \times 60 = 15$

Solution: 25% of 60 is 15.

Way ❷ Write the percent in decimal form.

$25\% = 0.25$

$0.25 \times 60 = 15$

Solve by writing the percent as a fraction.

1. 15% of 40 = n **2.** 90% of 30 = n **3.** 5% of 80 = n **4.** 75% of 20 = n

5. 12% of 25 = n **6.** 38% of 50 = n **7.** 40% of 25 = n **8.** 20% of 45 = n

Solve by writing the percent as a decimal.

9. 10% of 70 = n **10.** 14% of 50 = n **11.** 85% of 90 = n **12.** 29% of 55 = n

13. 30% of 61 = n **14.** 8% of 72 = n **15.** 2% of 57 = n **16.** 48% of 92 = n

Spiral Review (Chapter 22, Lesson 4) **KEY** MG 1.3

Find the volume of each solid figure.

17. 3 cm, 16 cm, 4 cm

18. 5 in., 9 in., 6 in.
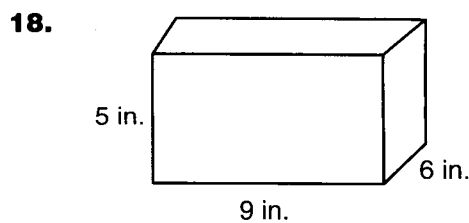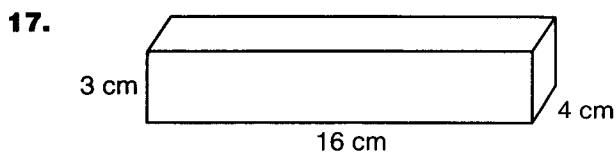
19. A gift box is 13 inches long, 6 inches wide, and 3 inches high. What is the volume of the box?

Percent of a Number

Solve.

1. The cost of a large pizza was $20. Anna gave the delivery driver a 15% tip. What was the amount of the tip?

_____

2. The bill for dinner was $76. Chuck left a 20% tip. How much was the tip?

_____

3. Carol likes to leave 10% of one night's stay for the cleaning crew at a hotel. If the Highfield Hotel charges $155 per night, how much did Carol leave for the cleaning crew?

_____

4. Which is greater, 20% of 40 or 40% of 20? Explain your answer.

_____

_____

_____

5. Deanna said she can find 60% of a number by finding 10% of a number and multiplying by 6. Is Deanna correct? Give an example.

_____

_____

_____

_____

_____

6. The cost of dinner for a family of four was $128. They left the waiter a total of $151.04, including the tip. What percent of the bill was the tip?

_____

Problem Solving: Percent Problems

CA Standards
KEY NS 1.2, MR 2.6

Example 1 Sometimes you want to find the percent of a number.

The pool where Jeremy swims is 40 feet long. For 60% of that length, the water is shallow. For what length of the pool is the water shallow?

What number is 60% of 40?

$n = 0.60 \times 40$ $n = 24$ feet

Example 2 Sometimes you want to find what percent one number is of another number.

Jeremy wants to swim 15 lengths of the pool. He has completed 3.75 lengths. What percent has he completed?

What percent of 15 is 3.75?

$15 \times n = 3.75$ $n = \frac{3.75}{15}$

$n = 0.25 = 25\%$

Example 3 Sometimes you want to find a number when a percent is known.

The pool is in a building 60 feet wide. That is 75% of the length of the building. How long is the building?

75% of what number equals 60?

$0.75 \times n = 60$ $n = \frac{60}{0.75}$ $n = 80$ feet

Solve.

1. Out of 40 newspapers that Maureen sells at her news stand, 85% are copies of the Small Town Journal. How many copies of the Small Town Journal does she sell?

_____

2. David's class voted on what kind of cookies to have for the party. Out of a class of 20 students, 12 voted for chocolate chip. What percent voted for chocolate chip?

_____

Spiral Review (Chapter 22, Lesson 3) **KEY MG 1.3, MG 1.4**

Find the volume of each solid figure.

3. 4 in. 3 in. 13 in.

4. 7 cm 5 cm 11 cm

_____   _____
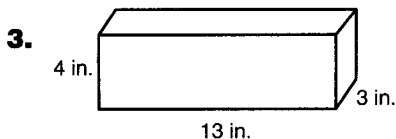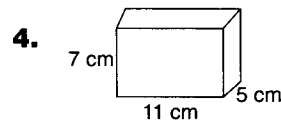
5. Tracy's sandbox has a length of 4 feet, a width of 2 feet, and a height of 1 foot. What is the volume of her sandbox? _____

Problem Solving: Percent Problems

CA Standards
KEY NS 1.2, MR 2.6

Solve.

1. Noah spent 50 minutes cleaning his room. For 20% of that time, he put away clothes. How long did he put away clothes? Hint: Write 20% as 0.20, then multiply by 50.

2. Out of 80 members of the community recreation club, 60 voted to have a spaghetti dinner each month. What percent voted to have a spaghetti dinner each month? Hint: Start by writing "60 out of 80" as $\frac{60}{80}$.

_____

3. Ten of the students in Kelly's class take dance classes after school. That number is 40% of the students in the class. How many students are in Kelly's class?

4. In Colin's school there are 300 students. If 138 are boys, what percent are girls?

_____

5. At Harry's Secondhand Shop, clothing is priced at 45% of the price it would be if it were new. Sales tax of 5% is added to each purchase. What would the final cost be for a shirt that was priced at $24 when it was new?

6. Tori bought her skates at a clearance sale. The clearance price was 25% off the first sale price. The first sale price was 15% off the original price. If the clearance price was $51, what were the sale and original prices? Hint: If a new price is 25% off, what percent of the old price is it?

_____

Name _____ Date _____

Hands On: Make a Circle Graph

Use Circle Graphs.

Jenna asked students to name an activity they do after school. She displayed her results in a table. Make a circle graph to display the data.

Step 1 Use the percents to find the number of degrees needed to draw each section of the circle graph.

$0.45 \times 360° = 162°$

$0.15 \times 360° = 54°$

$0.25 \times 360° = 90°$

$0.15 \times 360° = 54°$

Step 2 Use a compass to draw a circle. Use a protractor to measure and draw each section of the graph.

After School Activities	
watching television	45%
riding bikes	15%
playing video games	25%
reading a book	15%
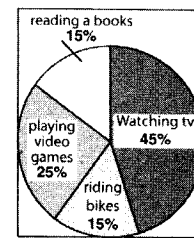
Use the circle graph for Problems 1 and 2.

1. If 300 students were surveyed, how many students ride bikes after school? _____

2. How many more students play video games than read a book after school? _____

3. How many students watch tv or ride bikes? _____

Spiral Review (Chapter 16, Lesson 5) **AF 1.1, SDAP 1.2**

Use the histogram to answer the questions.

4. How many students are between 53–56 inches in height? _____

5. How many students are at least 57 inches or taller? _____

6. A new student enters the fifth grade. His height is 62 inches. How does this students' height change the histogram?

Heights of Fifth Graders

Name _____ Date _____
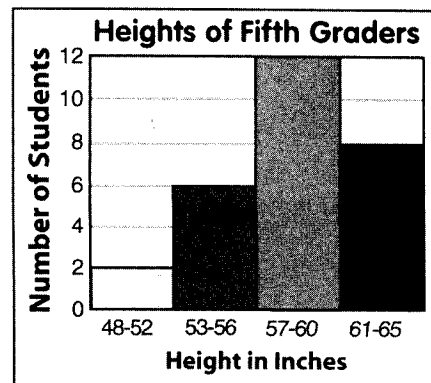
Make a Circle Graph

Solve.

1. The circle graph shows percents of customers who buy cookies, cakes, and pies at Betty's Cookie Bakery. Did more customers buy cakes or pies?

Betty's Cookie Bakery

Pies 15%

Cakes 20%
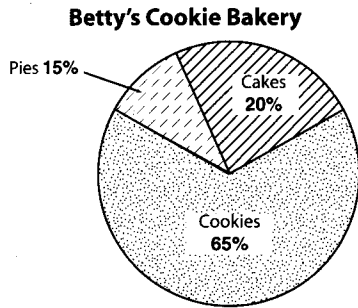
Cookies 65%

2. Last week, Betty had a total of 500 customers. Use the percents in the circle graph to tell how many customers bought cookies.
Hint: Find 65% of 500.

3. Sam surveyed his friends and found that 75% of them liked to wear jeans to school, 15% liked to wear cargo pants, and 10% liked to wear dresses. If he surveyed 20 people, how many liked to wear cargo pants?

4. If you were going to make a circle graph for the percents in Problem 3, what would the number of degrees be for each section?

5. In the election for math team treasurer, Carol got about 60% of the votes, Jose got about 20%, Kate got about 15%, and James got about 5%. If 42 people voted, about how many more votes did Carol get than James?

6. The math team also voted for a mascot. Of the 42 voters, 16 wanted a bulldog, 12 wanted a bobcat, 8 wanted a polar bear, 5 wanted a raccoon, and 1 wanted a hamster. About what percent wanted each mascot? Round to the nearest percent.

Compare Data Sets

Ed has 45 baseball cards. Twelve of them are rookie cards. Steve has 28 baseball cards. Twelve of them are rookie cards. Whose collection has a greater percent of rookie cards?

Write the parts as fractions in simplest form.

$\frac{12}{45} = \frac{4}{15}$ $\frac{12}{28} = \frac{3}{7}$

Way ❶ Compare fractions. You can compare by using a common denominator.

$\frac{4}{15} = \frac{28}{105}$ $\frac{3}{7} = \frac{45}{105}$ $\frac{28}{105} < \frac{45}{105}$ so $\frac{12}{45} < \frac{12}{28}$

Way ❷ Compare percents. Express each fraction as a percent, and then compare.

$\frac{4}{15} = 27\%$ $\frac{3}{7} = 43\%$ $27\% < 43\%$ so $\frac{12}{45} < \frac{12}{28}$

Solution: Steve has a greater percent of rookie cards.

**Write each set as a fraction in simplest form and as a percent.
Then order the percents from least to greatest.**

1. 6 out of 10 _____

2. 4 out of 20 _____

3. 5 out of 50 _____

4. 6 out of 15 _____

Compare. Use >, <, or = for each ◯   _____

5. 5 out of 25 ◯ 12 out of 48

_____

6. 18 out of 30 ◯ 10 out of 25

7. 3 out of 12 ◯ 12 out of 48

8. 30 out of 40 ◯ 16 out of 20

Spiral Review   (Chapter 16, Lesson 5) **AF 1.1, SDAP 1.2**

Use the line graph to answer questions 9–11.
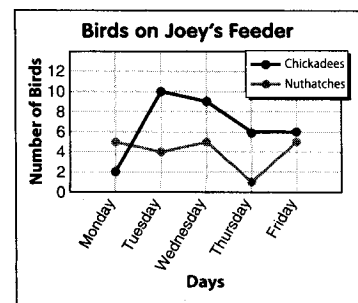
9. How many more chickadees than nuthatches did Joey see

on the birdfeeder on Tuesday? _____

10. On which day was the number of chickadees closest to

the number of nuthatches? _____

Birds on Joey's Feeder

11. On Saturday, Joey counted 3 times as many nuthatches and half as many chickadees as

on Thursday. How many of each bird did he count on Saturday? _____

Compare Data Sets

Solve.

1. Ferris bought 12 apples and 10 oranges at the market. He gave 4 apples and 2 oranges to his friend. Did he give away a higher percent of apples or oranges? Use fractions to solve the problem.

$$\frac{4}{12} = \underline{\qquad}$$

$$\frac{2}{10} = \underline{\qquad}$$

2. Kathy has 100 songs on her music player. 40 of them are by solo singers. Beth has 200 songs on her music player, and 60 of them are by solo singers. Who has the higher percent of songs by solo singers? Use percents to solve the problem.

$$\frac{40}{100} = \frac{2}{5}$$

$$\frac{60}{200} = \frac{3}{10}$$

3. The library where Jason borrows movies has 100 DVDs in its collection. 25 are cartoons. The library also has 80 videos, of which 24 are cartoons. Which has a higher percent of cartoons: the DVD collection or the video collection?

4. Jason has 25 DVDs and 16 videos at home. Of these, 5 DVDs and 4 videos are action films. Does he have a higher percent of action DVDs or action videos?

5. At Central Middle School, there are 656 students. 492 of them take a foreign language. At Eastern Middle School, there are 480 students. 384 take a foreign language. Which school has a higher percent of students taking a foreign language? Write the two percents.

6. Chloe took a pottery class for a year. Altogether, she and her classmates made 144 bowls and 96 vases in the first six months. In the second six months, they made 117 bowls and 63 vases. In which part of the year did they make a higher percent of bowls? Write percents for bowls and vases for each part of the year.

Mental Math: Percent of a Number

Find 10% of 75

Way ❶ Multiply by $\frac{1}{10}$.

$$\frac{1}{10} \times \frac{75}{1} = \frac{75}{10}$$
$$= 7.5$$

Way ❷ Move the decimal point one place to the left to divide by 10.

$$75 \div 10 = 7.5$$

Use mental math to find each number.

1. 10% of 167 _____
2. 75% of 12 _____
3. 25% of 160 _____
4. 50% of 62 _____

5. 20% of 80 _____
6. 75% of 32 _____
7. 20% of 20 _____
8. 10% of 175 _____

Spiral Review (Chapter 17, Lessons 3 and 4) **KEY SDAP 1.5, KEY AF 1.5**

Copy and complete the function tables.

9.

$y = 3x$	
x	**y**
	3
	9
$\frac{1}{2}$	
8	

10.

$y = x - 2$	
x	**y**
	12
7	
	4
$5\frac{1}{2}$	

11. Janet was going to a concert for her birthday. She planned to bring at least one friend, and pay for all the tickets. Each ticket costs $5, and she also had to pay $3 to park the car. Complete the function table to find the cost for Janet and one or more of her friends.

$y = 5x + 3$	
x	**y**
2	
	$18
4	
	$28

Mental Math: Percent of a Number

Solve.

1. Carolyn's family had a family reunion. In all, 50 family members attended. Of those who attended, 10% were grandparents. How many grandparents were at the family reunion?

$$\frac{1}{10} \times \frac{50}{1} =$$

2. Mikko's new organizer has 150 pages. 20% of the pages are blank sheets for notes. How many pages are blank? Hint: Find 10% then multiply by 2 to find 20%.

3. Edmund is painting his living room walls. The smallest wall measures 64 square feet. He can paint 75% of this wall with one small can of paint. Use mental math to determine how many square feet he can paint with one can of paint.

4. A family of four had dinner at their favorite Mexican restaurant. The cost of the dinner was $78. If the family plans to leave a 20% tip, how much tip will the waiter receive?

5. Audrey's school put on a fun fair to raise money for charity. Audrey's job was to calculate donations based on tickets sold. The tickets to the fair were $3 each, and 275 people attended. If the school was giving 15% of the ticket sales to charity, how much money were they able to give?

6. Zander was in charge of calculating profit at the refreshments booth. The booth offered lemonade at 50 cents a glass, cookies at 3 for $1.00, and popcorn at 75 cents a bag. They sold 175 glasses of lemonade, 300 cookies, and 150 bags of popcorn. Of the money they received, 55% went toward paying for ingredients, leaving the remainder for profit. How much profit did they make on refreshments?

Hands On: Positive and Negative Numbers

Use a number line to find the distance between ⁻6 and 0.
What is the absolute value of ⁻6?

6 units

⁻8 ⁻7 ⁻6 ⁻5 ⁻4 ⁻3 ⁻2 ⁻1 0 1 2
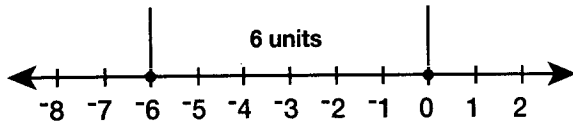
⁻6 is 6 units from zero.

Solution: The absolute value of ⁻6 is 6.

Write the opposite of each number.

1. ⁻12   **2.** ⁻5   **3.** ⁺18   **4.** ⁺29

_____   _____   _____   _____

5. ⁺73   **6.** ⁻92   **7.** ⁻317   **8.** ⁺47

_____   _____   _____   _____

Write the absolute value for each number.

9. 0   **10.** ⁻16   **11.** ⁺77   **12.** ⁻4

_____   _____   _____   _____

13. ⁺9   **14.** ⁻15   **15.** ⁺22   **16.** ⁻11

_____   _____   _____   _____

Spiral Review   (Chapter 24, Lesson 3) **KEY NS 1.2, NS 1.0**

Use mental math to find each number.

17. 25% of 400 _____   **18.** 10% of 315 _____

19. Mary and three friends went to lunch. Their total bill was $28. If they want to leave a 20% tip, how much tip will the waiter receive?

_____

Hands On: Positive and Negative Numbers

Solve.

1. The lowest temperature ever recorded in Alaska was 80°F below zero. Write that temperature as an integer in °F.
(Hint: Below zero indicates a negative number)

_____

2. The lowest temperature ever recorded in Hawaii was 12°F above zero. Write the *opposite* of that temperature as an integer in °F.

_____

3. In football, teams can gain or lose yards. In one play, a quarterback lost 8 yards. Write that loss as an integer, then write its opposite.

_____

4. Professional golfers try to score under par, which is the average number of strokes needed for each hole. Draw a number line with par marked at the zero point. Record these three scores as positive or negative integers on the number line: 4 under par, 3 over par, 1 under par.

_____

_____

5. The coldest temperature ever recorded on earth was −129°F. The highest temperature ever recorded was 136°F. What is the difference of the two temperatures?

_____

6. The highest temperature ever recorded in the United States was 134°F in California. The lowest temperature ever recorded was −80°F in Alaska. Explain how to find the difference of the two temperatures. Write the difference.

_____

_____

_____

_____

_____

_____

Compare and Order Integers

CA Standard
KEY NS 1.5

Order 1, ⁻2 and ⁻3 from least to greatest.
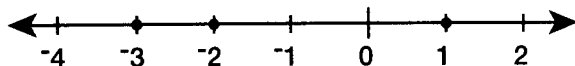
The integer farthest to the left is the least, and the integer farthest to the right is the greatest.

⁻3 < ⁻2 < ⁺1

Solution: The numbers in order from least to greatest are ⁻3, ⁻2, ⁺1.

Compare. Draw a number line from ⁻8 to ⁺8 and label each integer.
Write >, <, or = for each ⬭.

1. ⁺3 ⬭ 0

2. ⁻1 ⬭ ⁻4

3. ⁻5 ⬭ ⁻1

4. ⁻2 ⬭ 0

5. ⁺1 ⬭ ⁺4

6. ⁻5 ⬭ ⁻2

7. ⁻1 ⬭ ⁻7

8. ⁺4 ⬭ ⁻3

Write the integers in order from least to greatest. Draw a number line if you wish.

9. ⁻4, ⁻7, ⁻3, 0

_____

10. ⁺3, ⁻5, ⁺2, ⁻1

_____

11. ⁻12, ⁺8, ⁻9, ⁺10

_____

12. ⁺1, ⁻3, ⁻2, ⁺2

_____

Spiral Review (Chapter 24, Lesson 3) **KEY NS 1.2, NS 1.0**

Use mental math to find each number.

13. 100% of 97 _____

14. 25% of 236 _____

15. Jacob is reading a book that has 160 pages. So far he has read 75% of the book. How many pages has he read?

_____

Compare and Order Integers

Solve.

1. Put this list of integers in order, from least to greatest: ⁻1, ⁺2, ⁺5, ⁻3, ⁺1. Some are done for you.

_____, ⁻1, _____, ⁺2, _____

2. Sarah was asked to put a list of integers into order, from least to greatest. She wrote the numbers in this order: ⁺2, ⁻3, ⁺4, ⁻5, ⁺5 . What did she do wrong? What is the correct order?

_____

_____

_____

3. In golf, the lowest score wins. Five golfers scored ⁻3, ⁺5, ⁻4, ⁺2, and ⁺3. Order the score from the best score to the worst score.

_____

4. Write two numbers that are better than the worst score in Problem 2 but not as good as the middle score.

_____

5. Put this set of numbers in order, from least to greatest: ⁺3, ⁻5, ⁺4, ⁻9, ⁻2, ⁺7, ⁻1, ⁺6. Which number has the greatest absolute value?

_____

_____

_____

6. If you take 25% of a negative integer, will the new number be greater or less than the original integer? Explain and give an example.

_____

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____

Add Integers

Find $^-4 + {}^+5$.

Step ❶ Use circles to show negative integers.

Step ❷ Use squares to show positive integers.
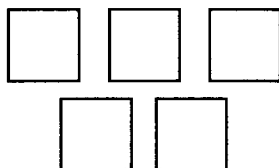
Step ❸ Match each circle to a square.
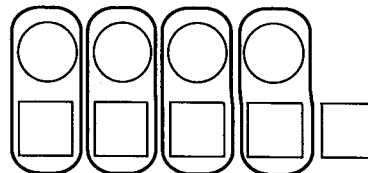
Since 1 square remains, the sum is positive 1.

Solution: $^-4 + {}^+5 = {}^+1$

Write the addition expression shown by the circles and squares and then find the sum.

1. ☐☐☐◯

_____

2. ◯◯◯◯◯☐☐

_____

3. ◯◯◯◯☐☐☐

_____

4. ☐☐☐☐☐◯◯◯

_____
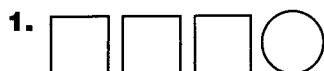
Solve. Use counters to help you.

5. $^+8 + {}^-6$

6. $^-7 + {}^-5$

7. $^-7 + {}^+2$

8. $^-9 + {}^+8$

_____ _____ _____ _____

9. $^+6 + {}^-10$

10. $^-11 + {}^+6$

11. $^-3 + {}^-2$

12. $^+10 + {}^-3$

_____ _____ _____ _____

Spiral Review (Chapter 24, Lesson 3) **KEY** NS 1.2, NS 1.0

Use mental math to find each number.

13. 25% of 452 _____

14. 20% of 300 _____

15. Sara bought a sweater on sale for 10% off the original price. If the sweater was originally $32, how much money did she save?

_____

Name _____ Date _____

Add Integers

Solve. White counters are positive. Gray counters are negative.

1. Kelly used counters to make this model but needs help completing the expression. Find the missing integers. What is the sum shown by the counters?

⚪⚪⚪⚪⚫⚫⚫

_____ + $^-3$ = _____

2. Jamie wrote the expression $^+2 + {}^-4 = {}^+2$ to represent this model. What mistake did Jamie make? Write the correct expression.

⚪⚪⚫⚫⚫⚫

_____

_____

_____

_____

3. Sarah made the model below to represent $^+1 + {}^-5$. What is the sum?

⚪⚫⚫⚫⚫⚫

_____

4. How many counters will Rebecca use to model the sum of the expression $^-3 + {}^+5$?

⚫⚫⚫⚪⚪⚪⚪⚪

_____

5. Adam and Joe both made models of the expression $^-3 + {}^+2 + {}^-2$. Whose model is correct? Explain.

ADAM
⚪⚪⚪⚫⚫⚪⚪

JOE
⚫⚫⚫⚪⚪⚫⚫

_____

_____

_____

_____

_____
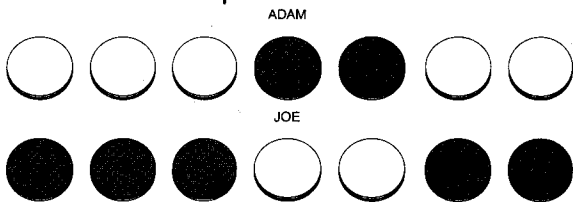
6. Mrs. Jessen asked her class to write the equation shown by this model. What is the equation shown?

⚪⚪⚫⚫⚫⚫⚪

_____

Name _____ Date _____

Add Integers On a Number Line

CA Standards
KEY NS 2.1, **KEY** NS 1.5

Find $^+6 + {}^-2$.

Solution: $^+6 + {}^-2 = {}^+4$

Use a number line to add.

1. $^-2 + {}^+5$

2. $^-8 + {}^+7$

3. $^-6 + {}^-3$

4. $^+8 + {}^+6$

_____ _____ _____ _____

5. $^-1 + {}^-9$

6. $^-8 + {}^+10$

7. $^+11 + {}^-9$

8. $^-10 + {}^+7$

_____ _____ _____ _____

Find each sum. Then compare. Write >, <, or =.

9. $^-2 + {}^+5 \bigcirc {}^+3 + {}^-1$

10. $^-3 + {}^-2 \bigcirc {}^-7 + {}^+2$

11. $^-1 + {}^+1 \bigcirc {}^-1 + {}^-1$

12. $^-7 + {}^-2 \bigcirc {}^-3 + {}^-4$

Spiral Review (Chapter 24, Lesson 3) **KEY** NS 1.2, NS 1.0

Use mental math to find each number.

13. 10% of 815 _____

14. 20% of 500 _____

15. During the election for class president Marie received 25% of the vote and Rachel received 50% of the vote. If 60 people voted, how many more votes did Rachel receive than Marie?

_____

Add Integers on a Number Line

Solve.

1. In a game, Patricia scored 3 points and then lost 7 points. What is her score so far? Use the number line to help.
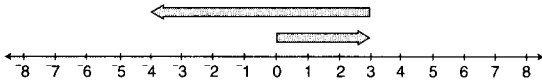
2. Andrew lost 6 points and then scored 8. What is his score so far? Use the number line to help.
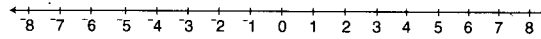
3. Josh had 4 points. He lost twice that many points. Then he scored 10 points. How many points did he have in all? Mark each step of his point scores and losses on a number line.
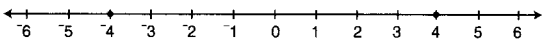
4. Susan scored 6 points, lost 5 points, scored 2 points, and lost 4 points. How many points does she need to score to have zero points? Mark each step of her point scores and losses on a number line.
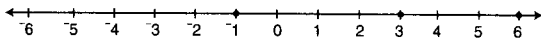
5. In the second quarter of the football game, Robin ran 14 yards in his first play. In his second play he ran 12 yards, but in his third play he lost 10 yards. How many yards did Robin gain after the three plays?

6. Derek started at the 15 yard line on his team's side of the field. He ran for 12 yards before he got tackled. During the next play, Derek lost 7 yards. What yard did Derek reach after his two plays?

Hands On: Subtract Integers

CA Standard
KEY NS 2.1

Find $^-3 - {}^+1$.

**Step ❶** Use circles to show negative integers. Use squares to show positive integers.

Step ❷ You need to subtract $^+1$ but there are no squares to take away. Add a circle and a square to show 0.

Step ❸ Take away a square to subtract $^+1$. What is left?

◯◯◯   ◯◯◯◯▢   ◯◯◯◯

Since 4 circles remain, the difference is negative 4.
Solution: $^-3 - {}^+1 = {}^-4$

Write a subtraction expression. Then find the difference.

1. ◯◯◯◯◯

Take away 2 squares.

_____

2. ◯◯◯◯

Take away 7 circles.

_____

Use two-color counters to find each difference.

3. $^+1 - {}^-5$ **4.** $^-2 - {}^+3$ **5.** $^-6 - {}^-1$ **6.** $^+2 - {}^-2$

_____   _____   _____   _____

7. $^+9 - {}^-11$ **8.** $^-7 - {}^-5$ **9.** $^+8 - {}^-5$ **10.** $^+8 - {}^-1$

_____   _____   _____   _____

Spiral Review (Chapter 23, Lesson 2) **KEY** NS 1.2

Find the percent by finding an equivalent fraction or dividing the numerator by the denominator.

11. $\frac{6}{20}$ _____

12. $\frac{3}{8}$ _____

13. In a survey 8 out of 20 people chose pepperoni as their favorite pizza. What percent of those surveyed chose pepperoni?

_____

Subtract Integers

Solve. White counters are positive. Black counters are negative.

1. Martin subtracted ⁻3 from ⁻5. what was his answer?

$$^-5 - {}^-3 = \underline{\hspace{1cm}}$$

2. What is the difference when you subtract ⁺3 from ⁺2?

$$^+2 - {}^+3 = \underline{\hspace{1cm}}$$

3. Carlos and his friends are playing a trivia game. For each correct answer, a player adds 1 point. For each incorrect answer a player subtracts 1 point. Carlos's score is ⁺3. What would be Carlos's score if he answers the next 5 questions incorrectly? Write an equation and solve.

_____

4. Eileen wrote that ⁻4 − ⁺4 = 0. Explain what Eileen's mistake was. Then tell the correct answer.

_____

_____

_____

5. The sum of two integers is ⁻3. The difference of the same two integers is ⁻13. What are the integers?

_____

6. If a negative integer is subtracted from a positive integer, can the answer be 0? Explain and give an example.

_____

_____

_____

_____

_____

_____

_____

Name _____ Date _____

Subtract Integers On a Number Line CA Standards
KEY NS 1.5, KEY NS 2.1

Use a number line to find ⁻2 − ⁻8.

Step 1 Start at 0. Model the first number by moving left 2 units to ⁻2.

Step 2 To subtract ⁻8, move 8 units to the right.

Step 3 The number you stop on is the answer.
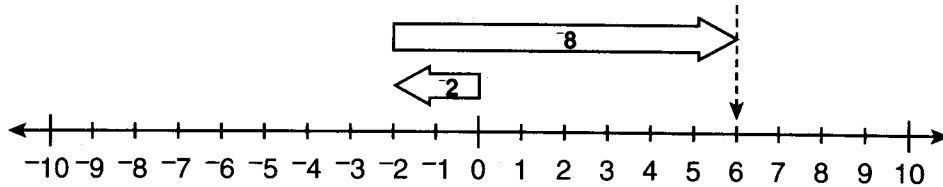
Solution: ⁻2 − ⁻8 = ⁺6

Use the number line to subtract.
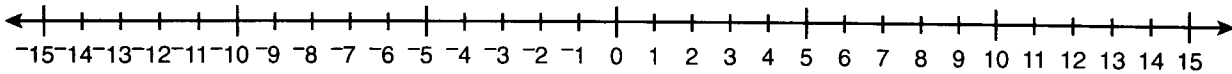
1. 0 − ⁻6

2. ⁻3 − ⁻11

3. ⁻9 − ⁻1

4. ⁺6 − ⁻4

_____ _____ _____ _____

5. ⁻11 − ⁺4

6. ⁻12 − ⁻8

7. ⁺3 − ⁻6

8. ⁺4 − ⁺7

_____ _____ _____ _____

9. ⁺6 − ⁺9

10. ⁻12 − ⁻5

11. ⁻5 − 0

12. ⁺8 − ⁻2

_____ _____ _____ _____

Spiral Review (Chapter 23, Lesson 2) **KEY NS 1.2**

Find the percent by finding an equivalent fraction or dividing the numerator by the denominator.

13. $\frac{2}{5}$ _____

14. $\frac{5}{20}$ _____

15. The Ice Cream Shoppe took a survey of 60 customers. Fifteen customers said strawberry was their favorite flavor of ice cream. Write $\frac{15}{60}$ as a percent.

_____

Use with text pp. 564–566

Name _____ Date _____

Subtract Integers on a Number Line

CA Standards
KEY NS 1.5, KEY NS 2.1

Solve.

1. What is the difference when you subtract ⁻4 from ⁻3?

$$^-3 - {}^-4 = \underline{\quad}$$

2. The temperature in the afternoon was 12°F. The temperature dropped 15 degrees by the evening. What was the temperature in the evening?
Hint: Subtract ⁺12 − ⁺15.
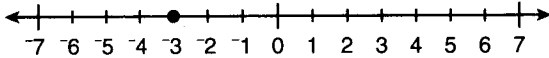
3. The lowest temperature in Chicago, Illinois was ⁻27°F. The lowest temperature in Portland, Maine, was ⁻39°F. What is the difference between the two lowest temperatures? Write an equation and solve.

4. The lowest temperature ever recorded in Florida was ⁻2°F. If you subtract 43°F, you will find the lowest temperature ever recorded in California. What is that temperature?

5. As a science experiment, the class placed three thermometers in different locations. Thermometer A recorded a temperature of 6°C. Thermometer B recorded a temperature 9 degrees less than Thermometer A. Thermometer C recorded a temperature 3 degrees warmer than Thermometer B. What were the three temperature readings?

6. Can you subtract two positive numbers and get a negative number? Explain and give an example.

Add and Subtract Integers

> **Rules for Adding and Subtracting Integers**
>
> • You can turn any subtraction expression into addition by adding the opposite.
> • The sum of two positive integers is positive.
> • The sum of two negative integers is negative.
> • The sum of a positive integer and a negative integer will have the same sign as the integer with the greater absolute value.

Decide if the sum or difference is positive or negative. Explain how you decided. Then solve.

1. $^-6 + {}^-8$

_____

2. $^-7 + {}^+10$

_____

_____

3. $^+1 + {}^-5$

_____

_____

4. $^-10 - {}^-4$

_____

_____

_____

_____

Spiral Review (Chapter 25, Lesson 2) **KEY NS 1.5**

Compare. Write $>$, $<$, or $=$ for the $\bigcirc$.

5. $^-6 \bigcirc {}^+2$ 6. $^-3 \bigcirc {}^-5$

7. Put this set of numbers in order, from least to greatest: $^+5, {}^-2, {}^+1, {}^-3$.

_____

Add and Subtract Integers

Solve problems 1–6.

1. Becky owes her mom $7. She pays back $5. Does Becky still owe her mom money? If so, how much?

2. Richard scored $^+3$ points and then he lost 5 points. What is his total score? Write a number sentence and solve.

3. The temperature on Tuesday morning was $^+4°F$. The temperature on Wednesday morning was $^-6°F$. What is the change in temperature from Tuesday to Wednesday morning? Write a number sentence and solve.

4. Janie borrowed $12 from Nick. Last week, Janie loaned Nick $7. Who owes whom money, and how much?

5. Gina had one ten−dollar bill and four one−dollar bills. She spent $7 on a book and $2 on a pen. Then she found one one−dollar bill in her coat pocket. How much money does Gina have now?

6. Eddie subtracted these three integers in some order.
$^-5$ $^+2$ $^+3$
His answer was $^+4$. Is this possible? Explain.

Name _____ Date _____

Problem Solving: Use a Number Line

The temperature rose from −7°F in the morning to 5°F by afternoon. How much did the temperature increase?

Understand.
Morning temperature: −7°F   Afternoon temperature: 5°F

Plan.
Use a number line.

Solve.
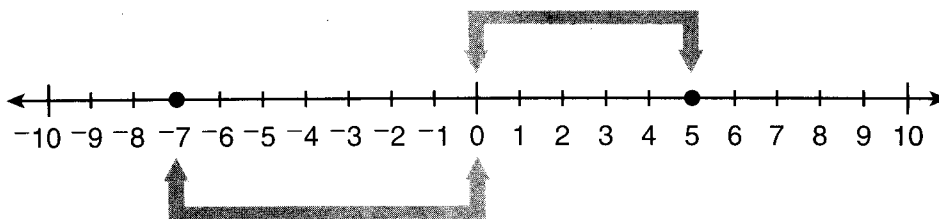
Solution: The total change in temperature: 12°F

Look Back.
Did you answer the question that was asked?
The temperature increased by 12°F.

Use a number line to solve. Explain why your answer makes sense.

1. The temperature was reported as 6°F. With the wind chill, the temperature felt as if it were ⁻6°F. What was the difference in temperature due to the wind chill?

_____

2. The temperature of a snow cone increased from ⁻10°F to 12°F. How much did the temperature increase?

_____

Spiral Review   (Chapter 25, Lesson 2) **KEY NS 1.5**

Compare. Write >, <, or =.

3. ⁻8 ◯ 2   4. ⁻3 ◯ 0

5. On the first down in a football game, a running back ran 12 yards. On the next down, he lost 7 yards. During which down did the running back run the greater distance?

_____

Problem Solving: Use a Number Line

Use a number line to solve. Explain why your answer makes sense.

1. The temperature rose from ⁻5°F to 3°F. What was the increase in temperature in degrees Fahrenheit?
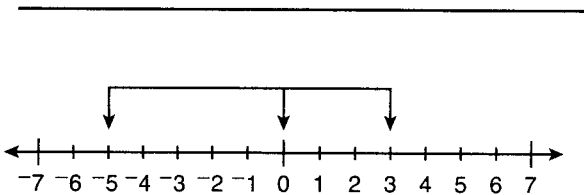
2. The thermometer read 5°F. Due to the wind chill, the temperature felt as if it were ⁻4°F. What was the difference in temperature?

_____

_____
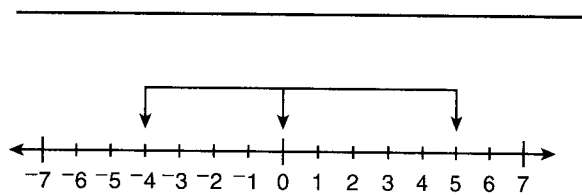
3. At 6:00 A.M., the temperature was ⁻4°F. By 2:00 P.M., the temperature had risen by 16°F. What was the temperature at 2:00 P.M.?

4. The thermometer read ⁻3°F in the freezer and 35°F in the refrigerator. What was the difference in temperature between the freezer and refrigerator?

_____

_____

5. On Thursday, the temperature rose from ⁻15°F to ⁻2°F. On Friday, the temperature rose from ⁻7°F to 7°F. Which day had a greater increase in temperature?

6. The weather report predicted the average weekly temperature to be 28°F. A fifth grade class recorded the weekly temperatures as 12°F on Monday, 18°F on Tuesday, 25°F on Wednesday, 30°F on Thursday, and 35°F on Friday. Find the difference between the predicted average temperature and the actual average temperature.

_____

_____

_____

_____

Name _____ Date _____

Hands On:
Plot Points in the Coordinate Plane

- A coordinate plane is formed by two perpendicular lines called axes that lie in the plane.

- The horizontal axis is called the x-axis, and the vertical axis is called the y-axis.

- The axes divide the grid into 4 quadrants, numbered I, II, III, and IV.

- Every point on a coordinate plane is named by an ordered pair, (x, y).

- The point named by the ordered pair (0, 0) is the origin.
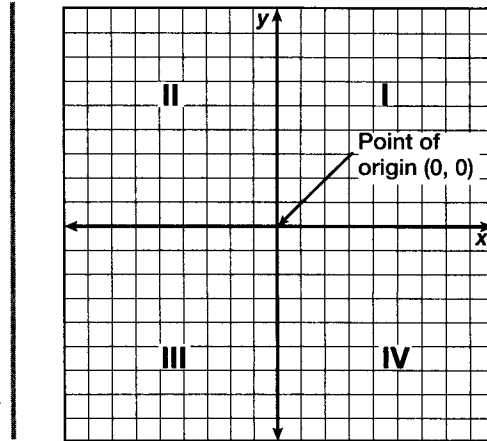
Use the graph for Problems 1–12. Write the ordered pair for each point.

1. I _____   2. A _____

3. C _____   4. B _____

5. P _____   6. H _____
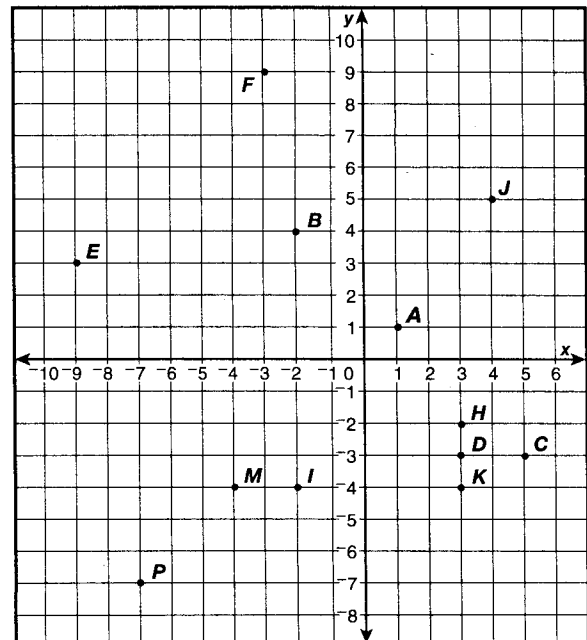
Write the letter name for each point.

7. (⁻9, ⁺3) _____   8. (⁺4, ⁺5) _____

9. (⁺3, ⁻4) _____   10. (⁻4, ⁻4) _____

11. (⁻3, ⁺9) _____   12. (3, ⁻3) _____

Spiral Review (Chapter 23, Lesson 4) **KEY** NS 1.2, MR 3.2

Find the value of x.

13. x = 25% of 100 = _____   14. 33% of 30 = x _____

15. Juan saw a pair of sneakers on sale for 20% off. If the price of the sneakers is $60, how much will Juan save?

_____

Hands On:
Plot Points in the Coordinate Plane

Solve.

1. Trevor plotted the ordered pair (4, ⁻6). Describe the movement he should make on the horizontal axis.

_____

_____

2. Plot the letter A on the coordinate grid at (2, 5).

_____
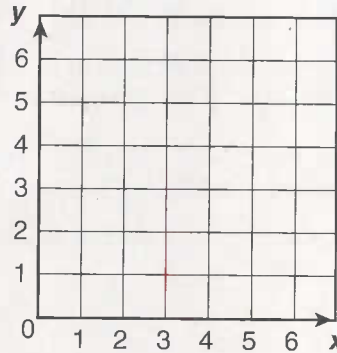
3. Start at (3, ⁻4). If you go to the left 4 places and up 2 places, what are the coordinates of the new ordered pair?

_____

_____

4. India plotted the ordered pairs (1, 3), (3, 3) and (3, 1). She connected the points and said she made a square. Explain what India's mistake was. How could she correct her mistake?

_____

_____

5. Samantha plotted the points (⁻2, 5) and (⁻2, ⁻2). What is the distance between the two points?

_____

_____

6. Natalie plotted the ordered pairs (4, ⁻1), (1, ⁻4), (10, ⁻7), and (7, 2). If she connects the points, what figure does she make?

_____

_____

Read a Map

- Ordered pairs can be used to locate points on a map.
- Use a compass to identify the directions of North, South, East, and West.

```
            North
              ↑
West ←————————————→ East
              ↓
            South
```
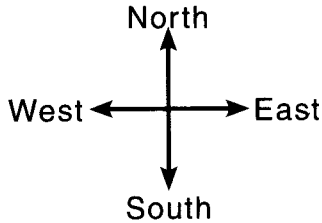
- Plot the ordered pairs on the coordinate grid.
- Find the distance between two points by counting the number of units.
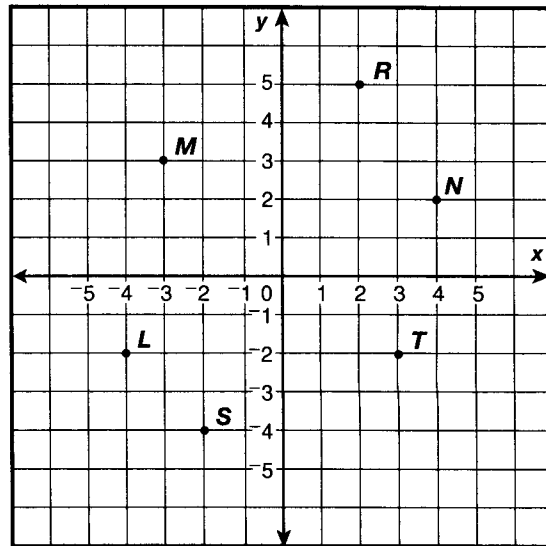
Use the map. Write the location for the letter.

1. R _____

2. S _____

3. T _____

4. L _____

5. M _____

6. N _____

Use the map below. Write the letter that you can see at each location.

7. (4, −3) _____

8. (−2, 4) _____

9. (2, 2) _____

10. (−5, −3) _____
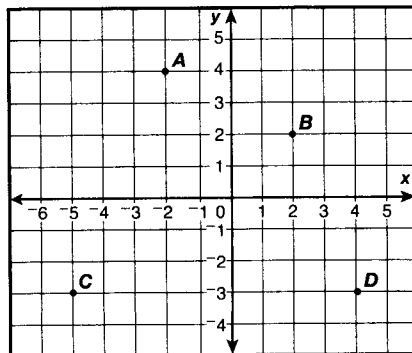
Spiral Review (Chapter 23, Lesson 4) **KEY NS 1.2, MR 3.2**

Find the value of n.

11. n = 20% of $100 _____

12. n = 10% of $80 _____

13. Addison finds a shirt on sale for 30% off the regular price of $50. How much will Addison save?

_____

Name _____ Date _____

Read a Map

Solve.

1. The Monkey House is located at $(-1, 5)$. In what Quadrant is the Monkey House located? **Hint:** Remember the quadrants go counter clockwise.

_____

2. The location of the zoo's concession stand can be found at $(4, 1)$. Write the letter C at this location on the map.
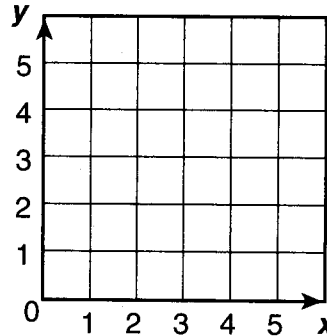
3. The zoo information booth is at the origin. Move 4 units to the west and 3 units to the north to the petting zoo. Write the ordered pair of the petting zoo.

_____

4. The zoo gift shop is located at $(4, 4)$ and the ice cream stand at $(2, -1)$. Give directions from the gift shop to the ice cream stand.

_____

_____

5. The zoo is located at $(-5, 4)$ and the art museum at $(-5, -3)$. Each unit is equal to 3 miles. What is the distance in miles between the zoo and art museum?

_____

6. Four tortoises were sleeping in different locations in the exhibit. Terri was asleep at $(5, -1)$, Tasha at $(2, -5)$, Trevor at $(2, -1)$, and Thomas at $(-4, 8)$. Which tortoise was sleeping furthest away from the origin?

_____

Name _____ Date _____

Integers and Functions

$y = 3x - 4$

Step ❶ Copy the function table to show values of x and y from the function
$y = 3x - 4$.

Step ❷ Use the equation to find the missing y-values.

If $x = 1$, then $y = 3(1) - 4 = {}^-1$
If $x = 2$, then $y = 3(2) - 4 = 2$
If $x = 3$, then $y = 3(3) - 4 = 5$
If $x = 4$, then $y = 3(4) - 4 = 8$

$y = 3x - 4$

x	y
1	⁻1
2	2
3	5
4	8

Copy and complete each function table.

1. $y = x + 4$

x	y
⁻3	
⁻2	
⁻1	
0	

2. $y = x - 3$

x	y
⁻2	
0	
2	
5	

3. $y = 6 - x$

x	y
⁻2	
0	
2	
5	

4. $y = 4x$

x	y
0	
1	
2	
3	

5. $y = x - 6$

x	y
⁻3	
0	
3	
6	

6. $y = 7x$

x	y
0	
1	
2	
3	

Spiral Review (Chapter 15, Lesson 3 and Lesson 5) **KEY NS 2.2**

7. $45 \overline{)5535}$ _____

8. $31 \overline{)86366}$ _____

9. A potato chip factory produces 92,673 bags of chips each day. If the factory produces chips for 9 hours a day, how many bags of chips do they produce in each hour?

_____

Integers and Functions

CA Standards
AF 1.0, [KEY] AF 1.5

Solve.

1. Becky is making cupcakes for her school's Bake Sale. She fills each box with 6 cupcakes. How many cupcakes are in 4 boxes?

Box	Number of Cupcakes
x	y
1	6
2	12
3	18
4	_____

2. Punch is also being sold at the Bake Sale. Each hour 12 cups of punch is sold. How many cups of punch will be sold after 3 hours?

Hours	Number of cups of punch
x	y
1	12
2	24
3	_____
4	_____

3. The function $y = 2x - 1$ describes the path a storm is taking. At noon, $x = 0$. Find the value of y at noon.

4. The function $g = s + 30$ expresses Gloria's age (g) in terms of Stephanie's age (s). How old will Gloria be when Stephanie is 33?

5. Coleman received 32 points from her first two tests in math. She scored 8 points more on her first test than her second test. What were her two test scores? Show the function that answers the question.

6. Kathy is twice as old as Brian. Brian is 3 years younger than Mason. If Mason is 7 years old, how old are Kathy and Brian? Write equations to show your work. Write their ages in order from least to greatest.

Graph Functions and Integers

CA Standard
KEY AF 1.5

How to Graph an Equation		
Step ❶ Complete the function table.	Step ❷ Graph each ordered pair.	Step ❸ Extend the line.

Copy and complete the function table. Then graph the function in a coordinate plane.

1. $y = 4x - 2$

x	y
0	
1	
2	
3	

2. $y = 3x + 2$

x	y
0	
1	
2	
3	

Which of these ordered pairs are on the line described by $y = 2x + 5$?

3. $(1, 8)$ _____

4. $(^-3, ^-11)$ _____

5. $(1, 7)$_____

6. $(^-4, ^-3)$ _____

7. Maria used the equation and table to graph the cost of renting a bicycle. If x represents the number of hours the bicycle is rented, and y represents the cost, what does her graph look like?

x	y
1	9
2	12
3	15

_____

Spiral Review (Chapter 23, Lesson 4) **KEY NS 1.2, MR 3.2**

8. Find 18% of 64. _____

9. Find 80% of 37. _____

10. Maureen got 40% of her math test incorrect. If her test was 50 questions, how many questions did Maureen get incorrect?

_____

Graph Functions and Integers

Solve.

1. Use the equation and function table to graph the equation on the coordinate plane. $y = x + 6$

$y = x + 6$	
x	**y**
−2	_____
−1	_____
0	_____
1	_____

2. The equation represents the points earned or lost in a game. Use the equation to complete the function table.

$y = 2x - 5$	
x	**y**
−1	_____
0	_____
2	_____
4	_____

3. The equation $y = x - 4$ represents the number of coins Sarah has in her coin collection, if Stephen has x coins. If Stephen has 35 coins, how many coins does Sarah have?

_____

4. The equation $y = 2x + 1$ represents the number of blocks Michelle walks in x minutes. Michelle used the equation to make the table. Graph the equation on the coordinate plane.

x	y
1	3
2	5
3	7
4	9

5. The equation $y = 5x + 6$ can be used to find the cost of playing laser tag. Graph the function on the coordinate plane.

6. The equation $y = x - 3$ can be used to find the number of minutes it takes Drake to read a book. Graph the function on the coordinate plane.

Hands On: Linear Equations

CA Standards
KEY SDAP 1.5, **KEY** AF 1.5

How to Graph an Equation	
Step ❶ Make a function table with x and y columns.	**Step ❷** Graph each ordered pair.

Complete the steps to graph the equation $y = 3x + 2$ and check your work.

1. Make a function table. Use these values for x.

x	y
0	☐
1	☐
2	☐
3	☐

2. Write the ordered pairs.

_____

_____

3. Graph the equation.

4. Find two other points on the line and check to see if the coordinates make the equation true.

_____

_____

Spiral Review (Chapter 15, Lesson 5) **KEY NS 2.2**

5. $68\overline{)23{,}596}$ _____

6. $35\overline{)2{,}590}$ _____

7. Julian says that $73\overline{)4{,}307}$ is 59. Greg says that the quotient is 95. Who is correct? Explain.

_____

_____

Hands On: Linear Equations

CA Standards
KEY SDAP 1.5, **KEY** AF 1.5

Solve Problems 1–6.

1. Use the equation and function table to graph the equation on the coordinate plane.

$y = 2x$	
x	**y**
−2	−4
−1	☐
0	☐
1	2

2. The equation represents the points earned or lost in a trivia game. Use the equation to complete the function table.

$y = x - 3$	
x	**y**
−1	☐
0	−3
2	☐
4	☐

3. The equation $y = 2x - 4$ represents the number of rocks Justin has in his rock collection, if Skip has x rocks. If Skip has 23 rocks, how many rocks does Justin have?

_____

4. The equation $y = 5x + 8$ represents the number of miles Lennie jogs in x hours. Lennie used the equation to make this function table. Graph the equation on the coordinate plane.

x	**y**
1	13
2	18
3	23
4	28

5. The equation $y = 3x + 6$ can be used to find the cost of ice skating. Graph the *equation on* the coordinate plane.

6. Jake had this equation for homework: $y = -2x - 3$. Graph the equation on the coordinate plane.

Graphs of Formulas

George is helping his uncle move by packing toys into boxes. The length of each box is 7 inches and the height is 8 inches. To find how much each box will hold, George needs to find the volume using the formula $V = l \times w \times h$.

Make a graph to represent the formula
$V = 7 \times w \times 8$.

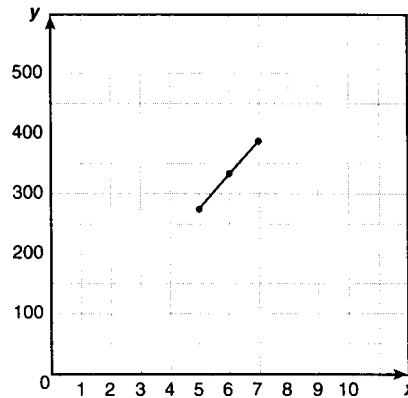**Step ①** Make a function table. Then write the ordered pairs.

Step ② Plot the points on a coordinate grid.

$V = 7 \times w \times 8$	
w	V
5	280
6	336
7	392

(5, 280)

(6, 336)

(7, 392)

Solution: The formula can be represented by the graph shown above.

Use the graph above. Find V (volume) for each value of w (width). Use the formula to check your answer.

1. $w = 8$ in.

2. $w = 10$ in.

3. $w = 30$ in.

_____   _____   _____

Use the graph above. Find w (width) for each value of V (volume). Use the formula to check your answer.

4. $V = 504$ in.^{3}

5. $V = 672$ in.^{3}

6. $V = 112$ in.^{3}

_____   _____   _____

Spiral Review   (Chapter 15, Lesson 5) **KEY NS 2.2**

Divide.

7. $49)\overline{15{,}533}$ _____

8. $86)\overline{4{,}902}$ _____

9. In one month, 8,670 visitors attended an art gallery. Tours were given to groups of 15 visitors. How many tours were given?

_____

Graphs of Formulas

Solve Problems 1–6.

1. Corrie is ordering a rug for her living room. The rugs come in various sizes. Complete the function table to find the area of the rugs.

$A = l \times 4$ ft	
l	**A**
3 ft	12 ft²
4 ft	16 ft²
5 ft	_____
8 ft	_____

2. Mariko is looking to purchase a new fish tank. Complete the function table to find the volume of the tanks Mariko is looking at.

$V = l \times 2$ ft $\times 3$ ft	
l	**V**
2 ft	12 ft³
3 ft	18 ft³
4 ft	_____
5 ft	_____

3. Sandra used the formula $A = s^2$ to find the area of squares. Complete the function table to find the area of various squares.

$A = s^2$	
S	**A**
3	_____
5	_____
7	_____
9	_____

4. Use the function table in problem 3 to create a graph of the formula $A = s^2$.

_____

5. The formula for the circumference of a circle is $C = d \times \pi$. Use the formula to make a function table and create a graph.

_____

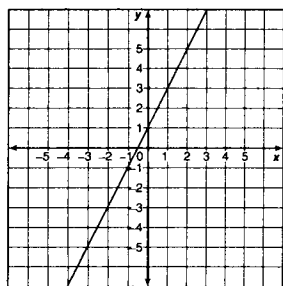**6.** The area for a triangle is $\frac{1}{2}b \times h$. Use the formula to make a function table and create a graph.

_____

Name _____ Date _____

Write Equations for Lines

Write an equation when the graph has already been made.

Monica drew this graph.

Which is the equation of Monica's line?

A $y = 3x + 1$ **C** $y = 2x + 1$

B $y = 3x + 2$ **D** $y = 2x + 13$

Step ❶ Find three points that lie on the line. (⁻1, ⁻1), (0, 1) and (1, 3) are three points on the line.
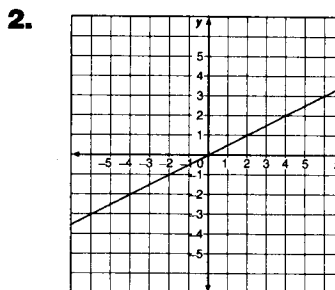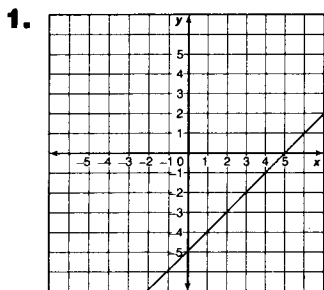
Step ❷ Test the ordered pairs in each equation. Remember that the equation must work for ALL of the ordered pairs.

Test Equation A $y = 3x + 1$	Test Equation B $y = 2x + 1$
(⁻1, ⁻1) ⁻1 ≠ 3(⁻1) + 1	(⁻1, ⁻1) ⁻1 = 2 (⁻1) + 1
	(0, 1) 1 = 2 (0) + 1
	(1, 3) 3 = 2 (1) + 1

Since the equation in choice B works, you do not need to test the other equations.

Solution: The equation of Monica's line is $y = 2x + 1$, choice C.

Write an equation for the graph.

1.

_____

2.

_____

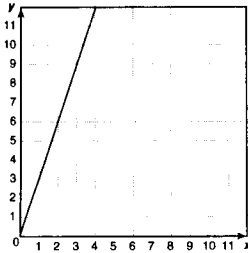**Spiral Review** (Chapter 23, Lesson 4) **KEY NS 1.2, MR 3.2**

Find each value.

3. 25 % of 160 _____

4. 65 % of 80 _____

**5.** Donna got 84% of the 50 questions on the test correct. How many questions did she answer correctly? _____

Name _____ Date _____

Write Equations for Lines

Solve Problems 1–6.

1. The graph shows the relationship between the amount Jeff saved and the number of weeks he saved. Write the equation for the graph.
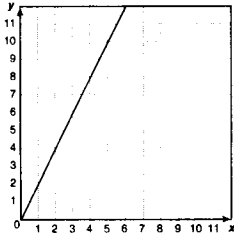
2. The graph shows the relationship between the number of piano lessons taken and the total cost of the lessons. Choose the equation that shows the rule of the graph.
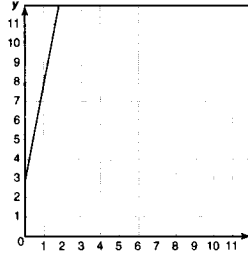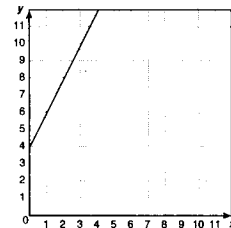
A $y = 5x - 3$

B $y = 3x + 5$

C $y = 5x + 3$

3. The graph shows the relationship between the cost of play tickets and the number of people buying tickets. Write the equation for the graph.
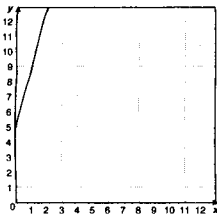
4. The graph shows the relationship between the number of people in a paddle boat and the cost of renting a paddle boat. Choose the equation that shows the rule of the graph.

A $y = 2x - 4$

B $y = 2x + 4$

C $y = 4x + 2$

5. The cost to rent bowling shoes is $5 per night. The cost to bowl is $4 per game. Write an equation that represents the cost of renting bowling shoes and playing x games in one night.

6. A car is traveling at 25 mph. The driver turns onto the highway and begins to increase speed. The car's speed increases at a rate of 5 mph each second. Write an equation that represents the car's speed after x seconds.

Name _____ Date _____
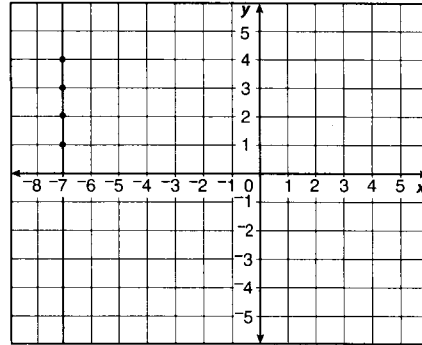
Equations of Horizontal and Vertical Lines

CA Standards
KEY AF 1.5, **KEY** AF 1.4

Graph the line x = ⁻7.

Step ❶ Make a function table. Choose 2 values for *y*. You already know the *x*-value is ⁻7.

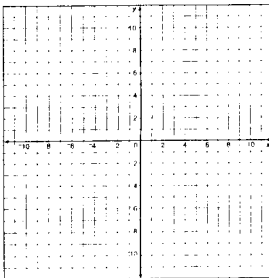| x = ⁻7	
x	**y**
—"	2
—"	ı

Step ❷ Plot the points in the coordinate plane and draw a line that passes through the points.

Step ❸ Find 2 other points on the line and check to see if their x-coordinates are also ⁻7. Other points on the line include (⁻7, 3), (⁻7, 4).

Graph the line with the given equation.

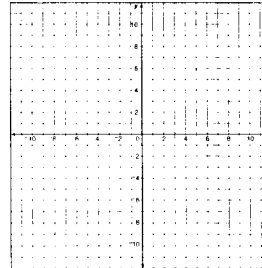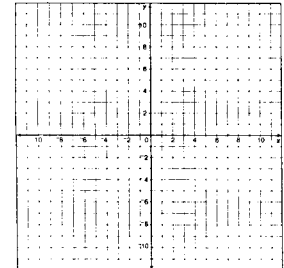**1.** $y = ^-1$

2. $x = 6$
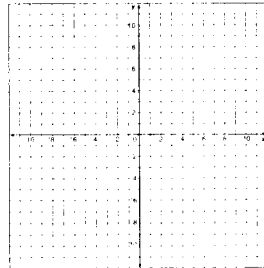
3. $y = 3$

4. $y = ^-9$

Spiral Review (Chapter 27, Lesson 1) **KEY** AF 1.4, **KEY** SDAP 1.5

Use the coordinate grid. Write an ordered pair for each point.

5. Point *R* _____

6. Point *S* _____

7. Point *P* _____

8. Point *Q* _____

Name _____ Date _____

Equations of Horizontal and Vertical Lines

Solve.

1. Raquel plotted 3 points on a coordinate plane: (4, 8), (1, 8), (0, 8). What is the equation for the line?

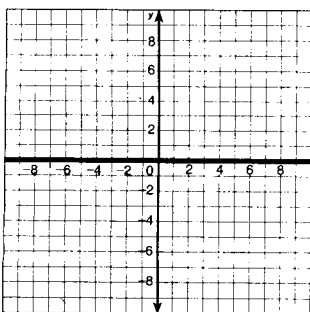**2.** Gina says the equation for the line on this graph is $y = {}^-4$. Is she correct? Explain.

_____

_____

3. Serena graphed a line that was parallel to the y-axis and contained the point (5, 2). What is the equation of Serena's line?
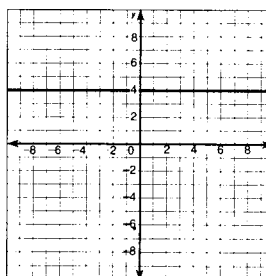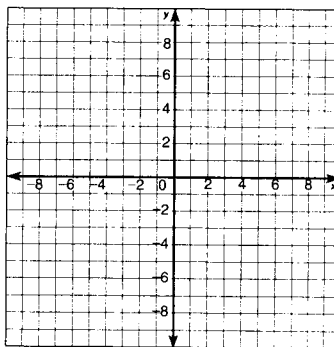
_____

4. Juan needs to graph a line with the equation $x = {}^-3$. Draw what Juan's line should look like.

5. Write the equation represented by the line shown below.

6. Look at both lines shown below. Which line represents the line $y = {}^-2$.



_____
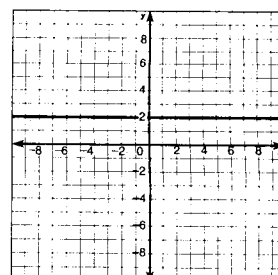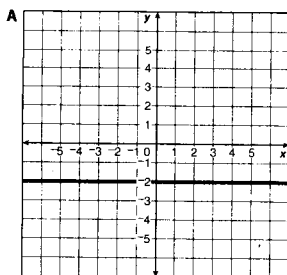
Name _____ Date _____

Problem Solving: Use a Graph

CA Standards
MR 2.3, **KEY** SDAP 1.4

Mercury is the closest planet to the sun and is about the same size as the moon. It is covered with mountains, craters, ridges, and valleys. Mercury takes about 88 days to make one complete orbit around the sun. How many days does it take Mercury to make multiple orbits around the sun?

Number of Orbits (x)	Number of Days (y)
1	88
2	176
3	264
4	352

Mercury's Orbit Around the Sun
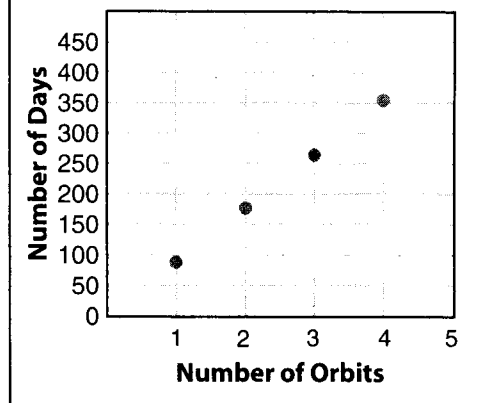
Step 1 Use the table to write ordered pairs: (1, 88), (2, 176), (3, 264), (4, 352).

Step 2 Graph the given coordinates.

Solve. Use the graph. Explain why your answer makes sense.

1. The graph and the table show the relationship between the number of orbits and the number of days it takes for Mercury to orbit around the sun. What information is displayed on the *x*-axis?

   _____

2. Use the graph and the table to find the number of days it would take for Mercury to orbit around the sun five times.
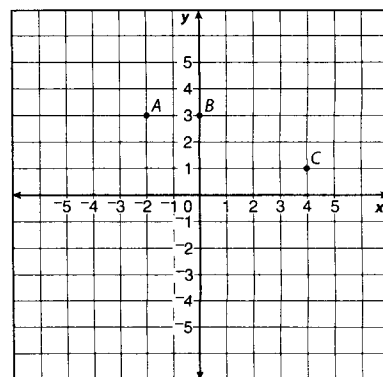
   _____

Spiral Review (Chapter 27, Lesson 1) **KEY SDAP 1.5**

Write the ordered pair for each point.

3. *A* _____

4. *B* _____

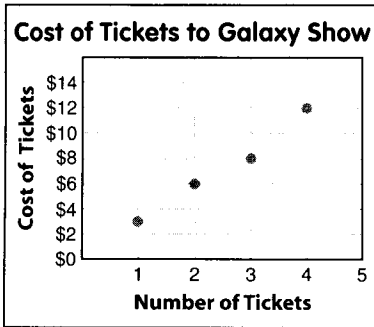5. Andre drew point *C* on the grid. What is the ordered pair for point *C*?

Problem Solving: Use a Graph

CA Standards
MR 2.3, SDAP 1.4

Solve.

1. Use the graph below to find the amount Julie would spend for 3 tickets to the Galaxy Show.

Cost of Tickets to Galaxy Show

2. Henry and his three friends each bought tickets to the Galaxy Show. How much money did they spend all together?

_____

3. The Science Center posted this table to list the cost of admission tickets. How much would it cost for 6 people to enter the Science Center?

Number of Tickets	1	2	3	4
Cost of Ticket(s)	$7	$14	$21	$28

4. Andrew used the table in 3 to plot ordered pairs on a graph: (1, 7), (2, 14), (3, 21), (4, 28), (5, 34). Describe his mistake.

_____

_____

_____

_____

5. It takes Neptune 164.79 years to make one complete orbit around the sun. Round to the nearest whole number and give the ordered pair of one complete orbit for the planet. Complete a graph to show the length of 4 orbits for the planet.

_____

_____

6. Raphael found this chart in a science book. Use the information to create a graph to display the data.

Distances between Planets and the Sun

Mercury: 36 million miles

Venus: 67 million miles

Earth: 93 million miles

Mars: 142 million miles