The fact family for the multiplication sentence **3 × 5 = 15** is:

$3 × 5 = 15$ $\qquad$ $5 × 3 = 15$ $\qquad$ $15 ÷ 3 = 5$ $\qquad$ $15 ÷ 5 = 3$

3. Complete the fact family for the given multiplication or division sentence.

a) $4 × 2 = 8$ $\qquad$ b) $5 × 6 = 30$ $\qquad$ c) $10 ÷ 2 = 5$

_____ $\qquad$ _____ $\qquad$ _____

_____ $\qquad$ _____ $\qquad$ _____

_____ $\qquad$ _____ $\qquad$ _____

d) $12 ÷ 4 = 3$ $\qquad$ e) $9 × 3 = 27$ $\qquad$ f) $6 × 8 = 48$

_____ $\qquad$ _____ $\qquad$ _____

_____ $\qquad$ _____ $\qquad$ _____

_____ $\qquad$ _____ $\qquad$ _____

4. Armand plants 24 trees in 3 rows. How many trees are in each row?

5. Alex plants 4 rows of trees with 7 in each row. How many trees did she plant?

6. A canoe can hold 3 people.

a) How many canoes are needed for 21 people?

b) How many people can go canoeing with 5 canoes?

7. You need 3 tickets to ride the roller coaster at the amusement park.
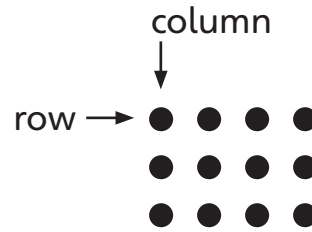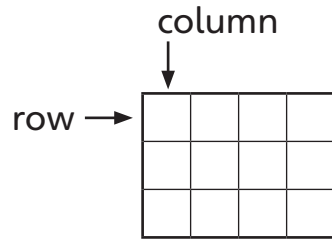
a) Mandy, Tom, and Jane want to ride the roller coaster. How many tickets will they need altogether?

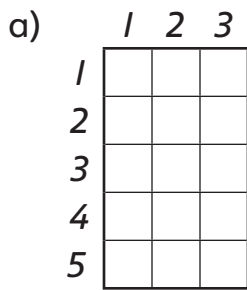b) How many tickets are needed for 8 people?

BONUS ▶ Kim has 17 tickets. If she pays for herself and 4 of her friends, how many tickets will she have left?

NS3-60 Rows and Columns

> **REMINDER** ▶ An array has rows and columns of objects, like squares or dots.

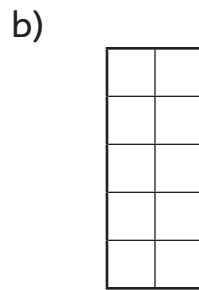**1.** Number the rows and columns. Write the total number of small squares in the array.

a)

_____5_____ rows

_____3_____ columns

total _____$5 \times 3 = 15$_____

or _____$3 \times 5 = 15$_____

b)

_____ rows

_____ columns

total _____

or _____

c)
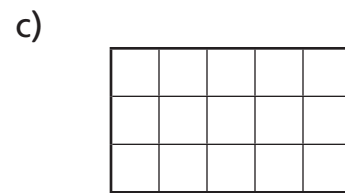
_____ rows

_____ columns

total _____

or _____

2. Count the rows and columns. Write the total number of dots in the array.

a)
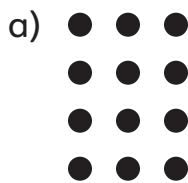
_____4_____ rows

_____3_____ columns

total _____$4 \times 3 = 12$_____

or _____$3 \times 4 = 12$_____

b)

_____ rows
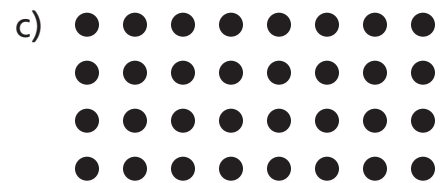
_____ columns

total _____

or _____

c)
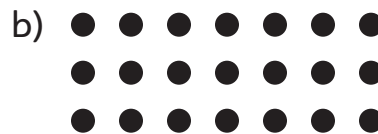
_____ rows

_____ columns

total _____

or _____

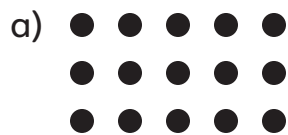**3.** Write a multiplication sentence for the total number of dots. Then write another multiplication sentence and two division sentences for the array.

a) ● ● ● ● ● ●
　 ● ● ● ● ●
　 ● ● ● ● ●

___3___ rows 　 ___5___ columns

total ___$3 \times 5 = 15$___

　　　 ___$5 \times 3 = 15$___

　　　 ___$15 \div 5 = 3$___

　　　 ___$15 \div 3 = 5$___

b) ● ● ● ● ● ●
　 ● ● ● ● ● ●

_____ rows 　 _____ columns

total _____

　　　 _____

　　　 _____

　　　 _____

4. The table gives the number of rows and columns in arrays. Write two multiplication sentences and two division sentences for each array.

	Rows	Columns	Total	Sentences
a)	5	2	10	$5 \times 2 = 10$ 　　 $10 \div 5 = 2$ $2 \times 5 = 10$ 　　 $10 \div 2 = 5$
b)	6	4	24	
c)	3	7	21	
d)	7	8	56	
e)	8	6	48	
f)	10	9	90	

5. The question mark (?) is the number we do not know. Write a sentence that gives the unknown.

	Rows	Columns	Total	Sentence
a)	3	5	?	$? = 3 \times 5$
b)	?	6	18	$? = 18 \div 6$
c)	?	2	16	
d)	4	?	36	
e)	7	8	?	
f)	9	?	45	

6. Ken plants 8 rows of trees. He plants 3 trees in each row. How many trees does he plant? Draw an array of dots to show your answer.

7. Randi arranges 35 chairs in rows with 5 chairs in each row. How many rows of chairs does she make?

8. Avril plants 12 flowers in 3 rows. How many flowers are in each row?

9. Mona arranges 9 rows of beads with 7 beads in each row. How many beads are in her array?

BONUS ▶ John makes an array using dimes. He makes 2 rows with 4 dimes in each row.

      a) How many dimes does John use?

      b) If John has 14 dimes in 2 rows, how many dimes are in each row?

BONUS ▶ Marko plants 6 rows of trees with 4 in each row. Tom plants 7 rows of trees with 3 in each row. How many more trees does Marko plant?

BONUS ▶ Wendy arranges 36 stickers with 6 in each row. Raj arranges 49 stickers with 7 in each row. Who has more rows?
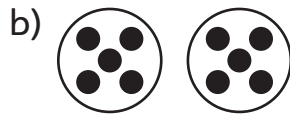
I. Write two multiplication sentences and two division sentences for the picture.

a)
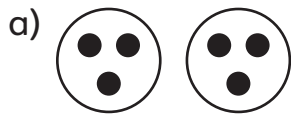
_____2_____ groups

_____3_____ in each group

_____6_____ in total

_____ $2 \times 3 = 6$ _____

_____ $3 \times 2 = 6$ _____

_____ $6 \div 2 = 3$ _____

_____ $6 \div 3 = 2$ _____

b)

_____ groups

_____ in each group

_____ in total

_____

_____

_____

_____

c)
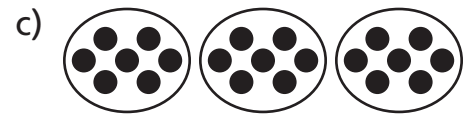
_____ groups

_____ in each group

_____ in total

_____

_____

_____

_____

2. Write two multiplication sentences and two division sentences for each row in the table.

	Number of Groups	Number in Each Group	Total	Sentences	
a)	3	7	21	$3 \times 7 = 21$ $7 \times 3 = 21$	$21 \div 3 = 7$ $21 \div 7 = 3$
b)	9	5	45		
c)	7	6	42		
d)	8	4	32		

3. Write a question mark (?) for the number you do not know.
Then write a sentence that gives the unknown.

	Problem	Number of Groups	Number in Each Group	Total	Sentence
a)	3 pears in each basket 12 pears How many baskets?	?	3	12	$? = 12 \div 3$
b)	4 toys in each box 6 boxes How many toys?				
c)	5 birds on each branch 35 birds How many branches?				
d)	3 children in each boat 12 children in total How many boats?				
e)	3 tents 15 children How many children in each tent?				
f)	5 rows of trees 40 trees How many in each row?				
g)	30 bananas 6 bananas in each bag How many bags?				
h)	9 coins in each pocket 4 pockets How many coins in total?				

4. There are 2 hamsters in each classroom. How many hamsters are in 8 classrooms?

5. Clara bought 24 stamps. There are 8 stamps in each pack. How many packs did she buy?

6. Ronin put 32 granola bars in 8 boxes. He put the same number in each box. How many did he put in each box?

7. Zack bought 8 packs of pens with 5 pens in each pack. Yu bought 9 packs of pens with 4 pens in each pack.

   a) How many pens did Zack buy?

   b) How many pens did Yu buy?

   c) Who bought more pens?

8. Ansel planted 24 flowers with 3 in each row. Marco planted 42 flowers with 6 in each row. Who planted more rows?

9. Rani planted 18 trees in 3 rows. Nina planted 24 trees in 6 rows. How many more trees are in Rani's rows than in Nina's rows?

10. A chess team has 4 players. School A sent 20 players to a chess match. School B sent 32 players to the match. How many more teams did School B send?

11. A basketball team has 5 players. School A sent 7 teams to a basketball match. School B sent 8 teams to the match. How many players did School A and School B send altogether?
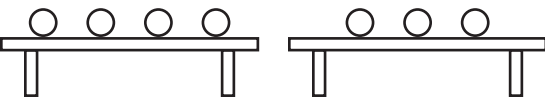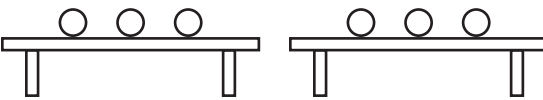
BONUS ▶ An amusement park ride costs 8 tickets. Each car on the ride can seat 3 children.

   12 children want to go on the ride.
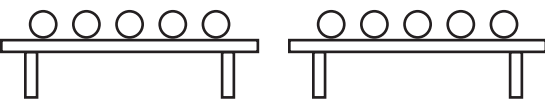
   a) How many cars on the ride will the children use?

   b) How many tickets are needed for all the children?
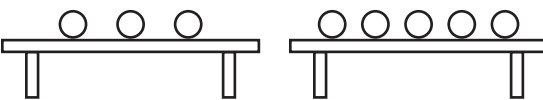
PA3-16 Equal and Not Equal

1. Write the number of balls on each table. Write = if the tables have the same number. Write ≠ if they do not have the same number.
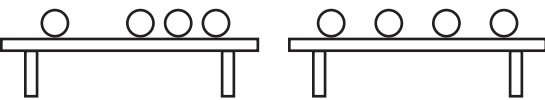
a) ___4___ [≠] ___3___
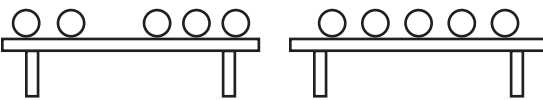
b) _____ [ ] _____
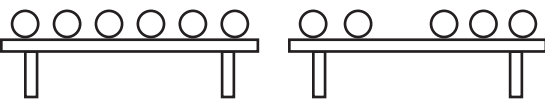
c) _____ [ ] _____
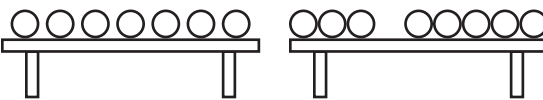
d) _____ [ ] _____
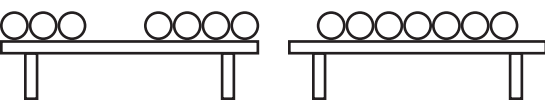
2. Write the number of balls. Write = or ≠ in the box.

a) ___1___ + ___3___ [ ] ___4___
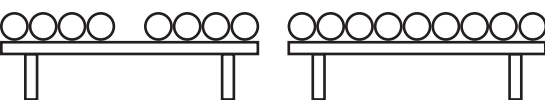
b) _____ + _____ [ ] _____
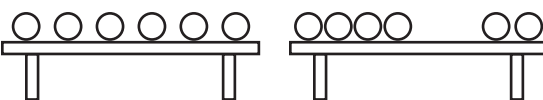
c) _____ [ ] _____ + _____

d) _____ [ ] _____ + _____

e) _____ + _____ [ ] _____

f) _____ + _____ [ ] _____

g) _____ + _____ [ ] _____

h) _____ [ ] _____ + _____

3. Circle the correct addition sentence.

a) $\boxed{7 = 3 + 4}$

   $7 \neq 3 + 4$

b) $9 = 5 + 3$

   $\boxed{9 \neq 5 + 3}$

c) $8 = 6 + 2$

   $8 \neq 6 + 2$

d) $5 = 3 + 1$

   $5 \neq 3 + 1$

e) $11 + 5 = 16$

   $11 + 5 \neq 16$

f) $12 + 3 = 15$

   $12 + 3 \neq 15$

An **equation** is a number sentence that has an **equal sign** (=).

$$3 + 5 = 8$$

$\uparrow$

equal sign

The equal sign shows that the left side of the number sentence has the same value as the right side.

4. Circle the number sentences that are equations.

A. $5 + 7 \neq 13$ **B.** $6 < 9$ **C.** $15 - 2 = 13$

D. $4 = 32 \div 8$ **E.** $6 \times 5 > 15$ **F.** $14 \neq 12 + 3$

5. Write "T" if the equation is true. Write "F" if the equation is false.

a) $3 + 7 = 10$ ___T___

b) $9 + 4 = 12$ ___F___

c) $2 + 17 = 18$ _____

d) $6 - 2 = 4$ _____

e) $24 - 5 = 19$ _____

f) $25 - 13 = 11$ _____

g) $3 \times 9 = 27$ _____

h) $6 \times 7 = 42$ _____

i) $56 = 8 \times 8$ _____

j) $24 \div 4 = 8$ _____

k) $12 \div 3 = 4$ _____

l) $6 = 35 \div 5$ _____

m) $14 + 13 = 27$ _____

n) $9 \times 3 = 28$ _____

o) $9 = 45 \div 5$ _____

p) $18 - 12 = 7$ _____

q) $4 = 15 - 10$ _____

r) $8 = 80 \div 10$ _____

BONUS ▶
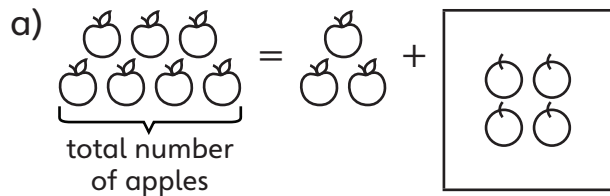
s) $2 + 4 = 3 \times 2$ _____
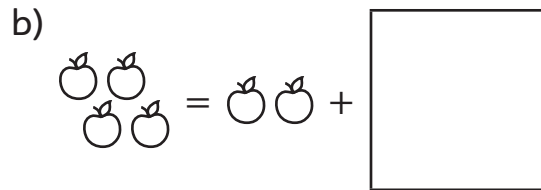
t) $5 + 6 = 14 - 2$ _____

u) $24 \div 6 = 10 - 6$ _____
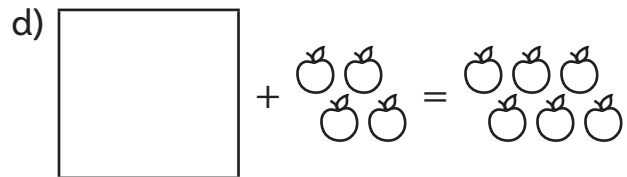
PA3-I7 Addition Equations
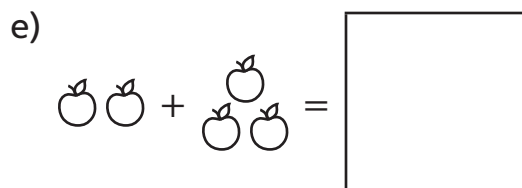
I. Some apples are inside the box and some are outside. Draw the missing apples in the box.

a)

total number of apples
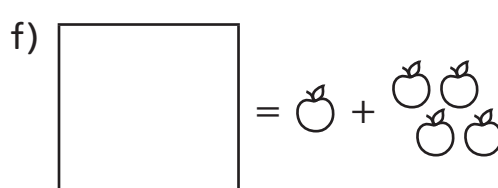
b)
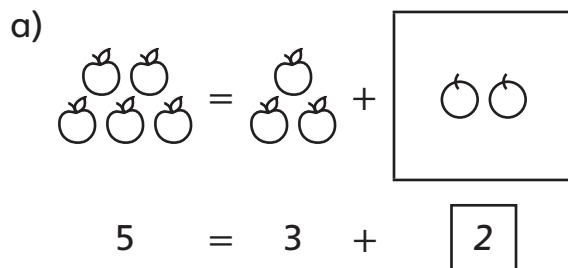
c)

d)
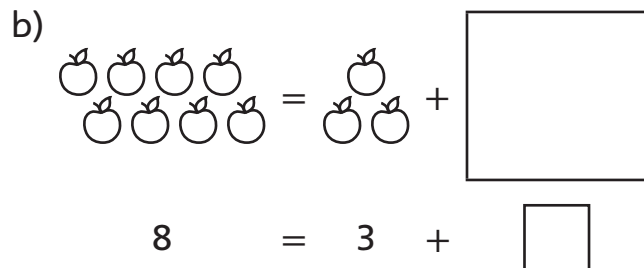
e)

f)

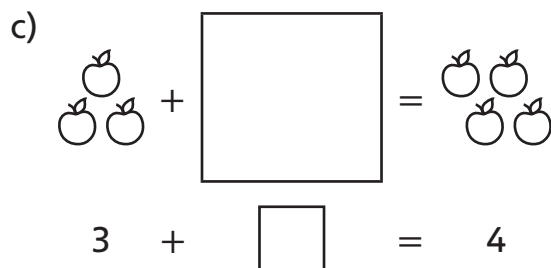**2.** Draw the missing apples in the box. Then write the missing number in the smaller box.

a)
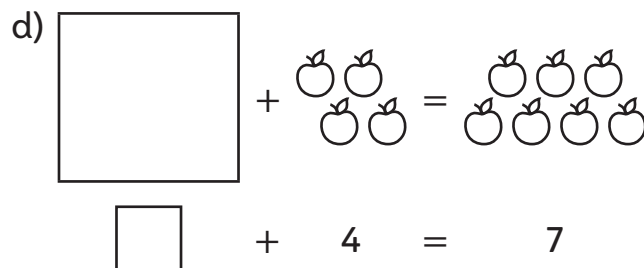
$$5 = 3 + \boxed{2}$$

b)
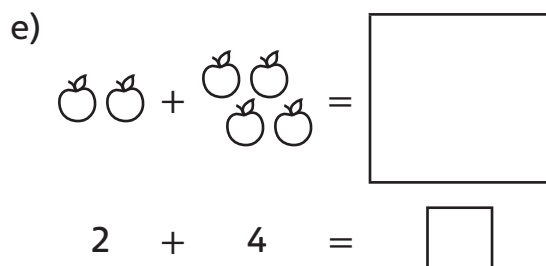
$$8 = 3 + \square$$

c)
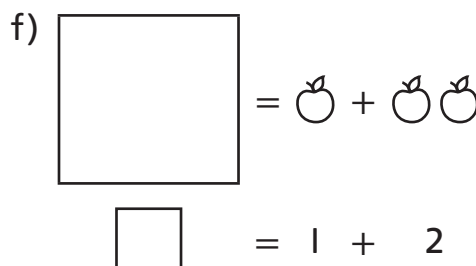
$$3 + \square = 4$$

d)

$$\square + 4 = 7$$

e)

$$2 + 4 = \square$$

f)

$$\square = 1 + 2$$

When you find the missing number in the equation, you **solve** it.

3. Draw a picture for the equation. Use your picture to solve the equation.

a) $5 + \boxed{} = 6$

b) $\boxed{} + 4 = 9$

c) $8 = \boxed{} + 3$

d) $\boxed{} = 4 + 4$

To solve $\boxed{} + 3 = 7$, Megan guesses the unknown number is 3.

Megan checks her guess. $\boxed{3} + 3 = 7$ is not true.

6 is too small. To make a bigger sum, she tries 4.

Megan checks her new guess. $\boxed{4} + 3 = 7$ is true, so the unknown number is 4.

4. Solve the equation by guessing and checking.

a) $\boxed{} + 3 = 4$

b) $2 + \boxed{} = 9$

c) $9 = \boxed{} + 4$

d) $10 = 6 + \boxed{}$

e) $5 + 7 = \boxed{}$

f) $\boxed{} = 7 + 6$

g) $15 = 9 + \boxed{}$

h) $\boxed{} + 8 = 16$

You can write 2 addition equations and 2 subtraction equations for this picture.

●●●○○○○

$3 + 4 = 7$ $4 + 3 = 7$ $7 - 3 = 4$ $7 - 4 = 3$

These equations make a **fact family**.

5. Write the fact family for the picture.

a) ●●○○○○○

b) ●●●○○○○○

c) ○○○○○○○●

_____

_____

_____

_____

_____

_____

_____

_____

_____

6. Draw a picture for the equation. Write the rest of the fact family.

a) $4 + 2 = 6$

⚪⚪⚪⚪⚫⚫

  $2 + 4 = 6, 6 - 2 = 4,$

  $6 - 4 = 2$

b) $6 + 1 = 7$

_____

_____

c) $6 - 1 = 5$

_____

_____

d) $9 - 4 = 5$

_____

_____

Some circles are in a box. ⚪⚪⚪ [____]

There are 8 circles in total. Anton wants to find how many circles are in the box.

He writes the equation $3 + \boxed{} = 8$.

Anton subtracts to find the number of circles in the box: $8 - 3 = \boxed{5}$

⚫⚫⚫ [⚪⚪⚪⚪⚪]

7. Draw a picture for the equation. Then write the subtraction to find the missing number.

a) $7 + \boxed{} = 9$

⚫⚫⚫⚫⚫⚫⚫ [____]

  $9 - 7 = 2$

b) $3 + \boxed{} = 10$

_____

c) $\boxed{} + 4 = 8$

_____

d) $5 = \boxed{} + 1$

_____

8. Write the subtraction equation to find the missing number.

a) $7 = 4 + \boxed{}$

  $7 - 4 = 3$

b) $10 = \boxed{} + 3$

c) $\boxed{} + 6 = 11$

d) $10 + \boxed{} = 19$
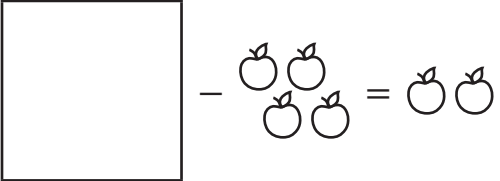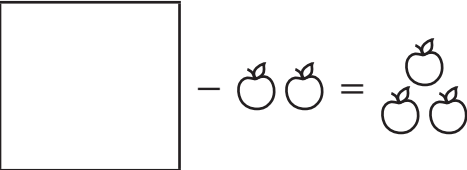
e) $\boxed{} + 21 = 32$ f) $42 + \boxed{} = 95$ g) $69 = \boxed{} + 14$ h) $80 = 36 + \boxed{}$

PA3-18 Subtraction Equations

1. Sam takes some apples from a box. Draw the apples that were in the box before.

a)

Sam takes away this many

this many are left
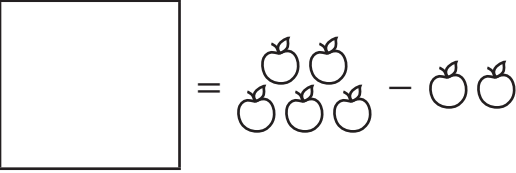
b)
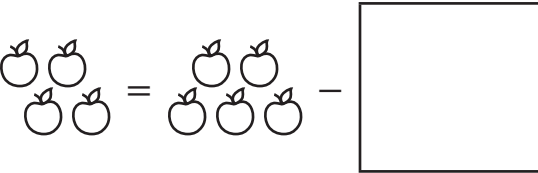
c)
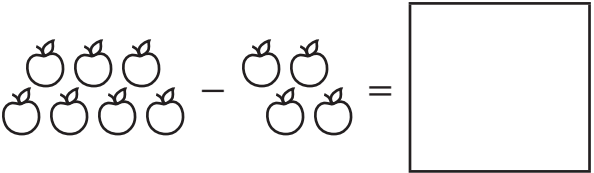
d)

2. Draw the missing apples. Then write the missing number in the smaller box.

a)

$$\square = 5 - 2$$

b)

$$6 - \square = 3$$

c)

$$4 = 5 - \square$$

d)

$$7 - 4 = \square$$

3. Draw a picture for the equation. Use your picture to solve the equation.

a) $6 - \square = 1$

b) $3 = \square - 6$

4. Solve the equation by guessing and checking.

a) $\boxed{} - 2 = 2$ b) $3 = \boxed{} - 4$ c) $8 - 3 = \boxed{}$ d) $\boxed{} = 10 - 2$

e) $9 - \boxed{} = 2$ f) $3 = 10 - \boxed{}$ g) $8 = \boxed{} - 2$ h) $15 - 7 = \boxed{}$

i) $\boxed{} - 8 = 10$ j) $13 = \boxed{} - 4$ k) $28 - 13 = \boxed{}$ l) $7 = \boxed{} - 9$

m) $16 - \boxed{} = 8$ n) $8 = 15 - \boxed{}$ o) $8 = \boxed{} - 6$ p) $20 - \boxed{} = 20$

Lela takes 3 apples from a box. 2 apples are left in the box.

$\boxed{} - 🍎🍎🍎 = 🍎🍎$

$\boxed{} \qquad - \qquad 3 \qquad = \qquad 2$

Lela adds the number of apples she took out and the number of apples left to find the number of apples that started in the box.

$3 \quad + \quad 2 \quad = \quad \boxed{5}$

$🍎🍎🍎 + 🍎🍎 = \boxed{🍎🍎🍎🍎🍎}$

---

5. Write an addition equation to find the number of apples that were in the box before.

a) $4 = \boxed{} - 3$ b) $\boxed{} - 1 = 8$ c) $10 = \boxed{} - 3$ d) $6 = \boxed{} - 4$

  _3 + 4 = 7_   _____   _____   _____

e) $\boxed{} - 6 = 6$ f) $\boxed{} - 9 = 4$ g) $9 = \boxed{} - 7$ h) $\boxed{} - 10 = 9$

  _____   _____   _____   _____

i) $\boxed{} - 16 = 6$ j) $\boxed{} - 23 = 14$ k) $19 = \boxed{} - 27$ l) $\boxed{} - 10 = 75$

  _____   _____   _____   _____

m) $\boxed{} - 21 = 32$ n) $\boxed{} - 42 = 40$ o) $61 = \boxed{} - 11$ p) $80 = \boxed{} - 50$

  _____   _____   _____   _____

REMINDER ▶ You can write a fact family for this picture. ⬤⬤○○○○

$$2 + 3 = 5, 3 + 2 = 5, 5 - 3 = 2, 5 - 2 = 3$$

6. Write the rest of the equations in the fact family.

a) $6 - 2 = 4$, _____

b) $10 - 7 = 3$, _____

7. Write the other subtraction equation from the same fact family.

a) $11 - 3 = 8$ b) $12 - 7 = 5$ c) $17 - 9 = 8$

   $\underline{\quad 11 - 8 = 3 \quad}$ _____   _____

To find the missing number in $7 - \boxed{} = 4$, use $7 - 4 = \boxed{}$.

We know $7 - 4 = 3$, so $7 - \boxed{3} = 4$.

---

8. Write the other subtraction equation from the same fact family.
Find the number in the box.

a) $7 - \boxed{} = 5$ b) $9 - \boxed{} = 4$ c) $10 - \boxed{} = 2$

   $\underline{\quad 7 - 5 \quad} = \boxed{2}$ _____ $= \boxed{}$ _____ $= \boxed{}$

d) $12 - \boxed{} = 5$ e) $14 - \boxed{} = 6$ f) $17 - \boxed{} = 10$

   _____ $= \boxed{}$ _____ $= \boxed{}$ _____ $= \boxed{}$

g) $32 - \boxed{} = 25$ h) $26 = 54 - \boxed{}$ i) $17 = 97 - \boxed{}$

9. Solve the equation.

a) $\boxed{} - 33 = 32$ b) $42 - \boxed{} = 40$ c) $71 = \boxed{} - 14$

d) $80 = 90 - \boxed{}$ e) $\boxed{} = 36 - 28$ f) $78 - 29 = \boxed{}$

g) $34 = \boxed{} - 7$ h) $\boxed{} - 40 = 15$ i) $\boxed{} = 67 - 39$

BONUS ▶

j) $100 - \boxed{} = 51$ k) $71 = \boxed{} - 29$ l) $\boxed{} - 100 = 0$

There are 4 equal parts.

Each part is one fourth.

One fourth is a fraction.
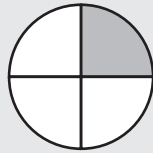
one fourth or $\dfrac{1}{4}$ ← number of parts shaded
← number of parts in the whole

You can write fractions with words or numbers.

I. Write the fraction for the equal parts with words and with numbers.

a)
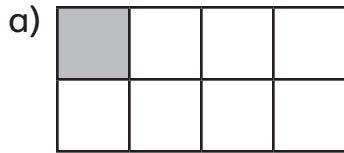
___8___ equal parts

Each part is

___one___ ___eighth___ or $\boxed{\dfrac{1}{8}}$.

b)

_____ equal parts

Each part is

_____ _____ or $\boxed{}$.

c)

_____ equal parts

Each part is

_____ _____ or $\boxed{}$.

d)
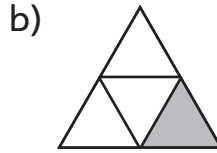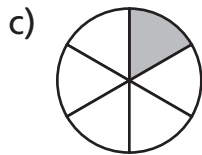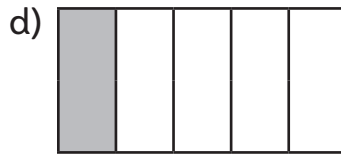
_____ equal parts

Each part is

_____ _____ or $\boxed{}$.

e)

_____ equal parts

Each part is

_____ _____ or $\boxed{}$.

f)
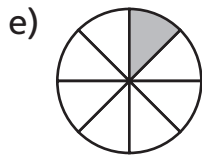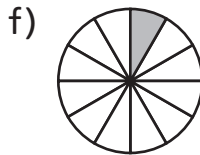
_____ equal parts

Each part is

_____ _____ or $\boxed{}$.

A **unit fraction** has only 1 equal part shaded. $\frac{1}{4}$

2. Write the unit fraction shown by the shaded part of the picture.

a) $\frac{1}{4}$

b)

c)

d)

e)

f)
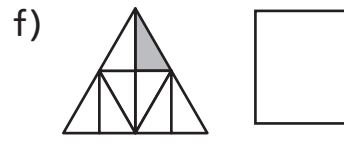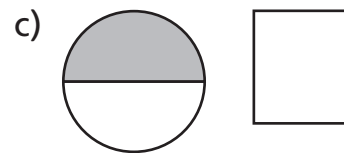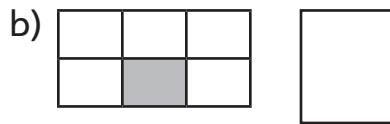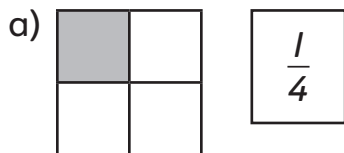
3. Shade the unit fraction.

a) $\frac{1}{5}$

b) $\frac{1}{2}$

c) $\frac{1}{4}$

d) $\frac{1}{10}$

e) $\frac{1}{3}$

f) $\frac{1}{6}$
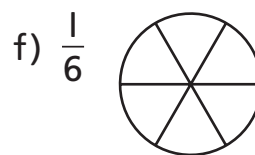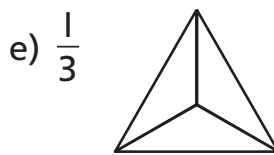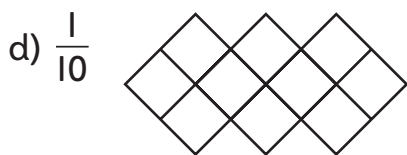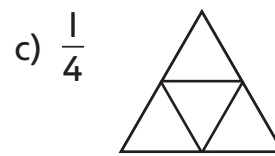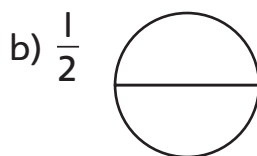
4. a) Circle the unit fractions.

$\frac{2}{3}$ $\frac{1}{4}$ $\frac{1}{8}$ $\frac{4}{7}$ $\frac{1}{5}$ $\frac{9}{10}$ $\frac{1}{6}$ $\frac{2}{9}$

b) Explain why the fractions that are not circled are not unit fractions.

_____

5. a) Circle the pictures that do not show one fourth.
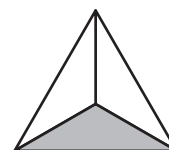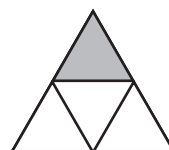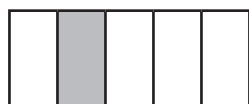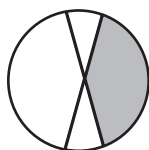
b) Explain why the pictures you circled do not show one fourth.
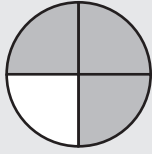
There are 4 equal parts. You can write the fraction as $\frac{3}{4}$.
3 parts are shaded.

$\frac{3}{4}$ ← The **numerator** tells you 3 parts are shaded.

← The **denominator** tells you 4 parts are in the whole.

I. Count the number of shaded parts and the number of equal parts in the picture. Then write the fraction shown by the shaded parts.

a)

___3___ shaded parts

___5___ equal parts

The fraction is $\boxed{\frac{3}{5}}$.
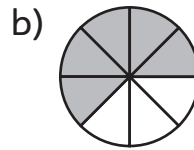
b)

_____ shaded parts

_____ equal parts

The fraction is $\boxed{}$.

c)

_____ shaded parts

_____ equal parts

The fraction is $\boxed{}$.

d)
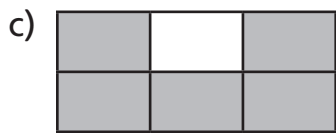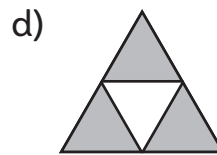
_____ shaded parts

_____ equal parts

The fraction is $\boxed{}$.

2. Write the fraction shown by the shaded part or parts.

a) $\boxed{\frac{2}{5}}$

b) $\boxed{}$

c) $\boxed{}$

d) $\boxed{}$

e) $\boxed{}$

f) $\boxed{}$
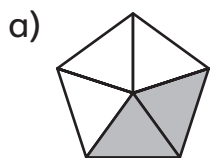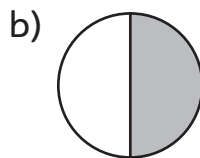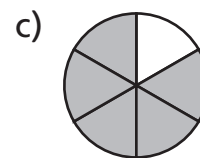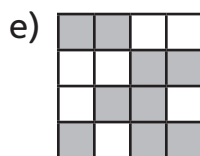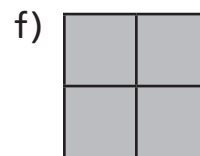
3. Shade parts to show the fraction.

a) $\frac{3}{4}$

b) $\frac{2}{3}$

c) $\frac{1}{5}$

d) $\frac{7}{8}$

e) $\frac{5}{6}$

f) $\frac{2}{2}$
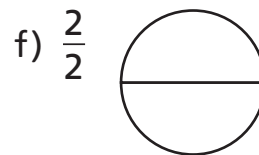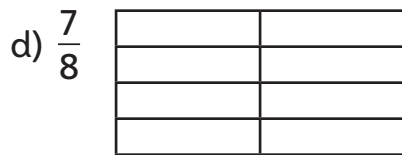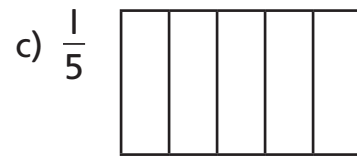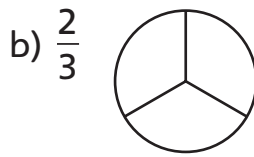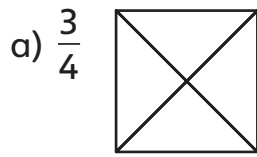
4. Write a fraction for the parts that are not shaded.
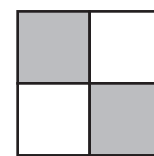
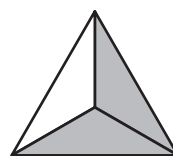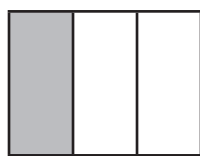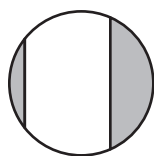a) $\boxed{\dfrac{1}{4}}$

b)

c)

d)

e)

f)
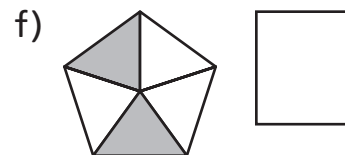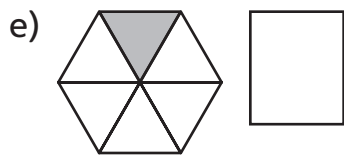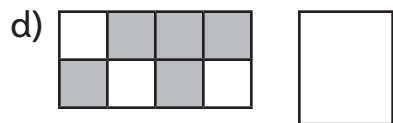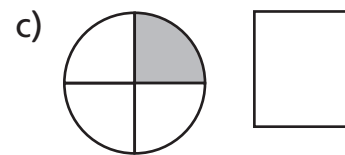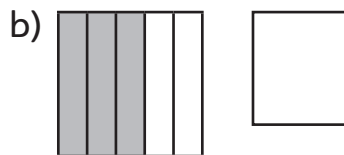
REMINDER ▶ In a fraction, there are equal parts in the whole.

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5. Circle the pictures that have equal parts in the whole.
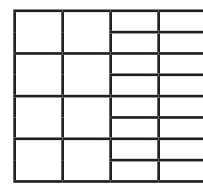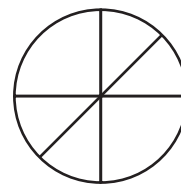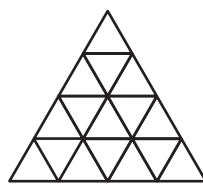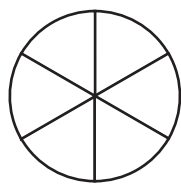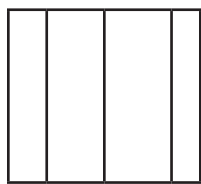
6. a) Circle the picture where the shaded region shows $\frac{2}{3}$.

b) For each picture not circled, explain why the shaded region does not show $\frac{2}{3}$.

7. Write the numerator of the fraction.

a) $\frac{3}{4}$ _____ b) $\frac{5}{8}$ _____ c) $\frac{1}{6}$ _____ d) $\frac{2}{7}$ _____

8. Write the denominator of the fraction.

a) $\frac{7}{8}$ _____ b) $\frac{1}{4}$ _____ c) $\frac{3}{5}$ _____ d) $\frac{5}{6}$ _____

9. You have $\frac{2}{5}$ of a pie.

a) What is the denominator of the fraction? _____

b) What does the denominator tell you? _____

_____

c) What is the numerator of the fraction? _____

d) What does the numerator tell you? _____

_____

10. In Fred's apartment building, $\frac{11}{16}$ of the apartments have people living in them.

a) What is the denominator of the fraction? _____

b) What is the numerator of the fraction? _____

c) How many apartments are in the building? _____

d) How many apartments have people living in them? _____
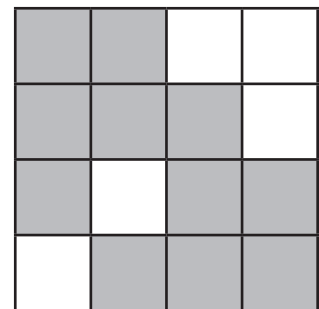
11. On Iva's school bus, $\frac{17}{24}$ of the seats are filled with students.

a) What is the denominator of the fraction? _____

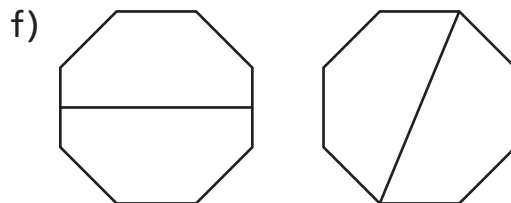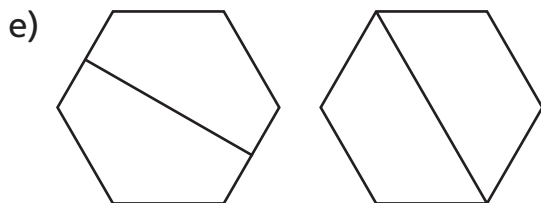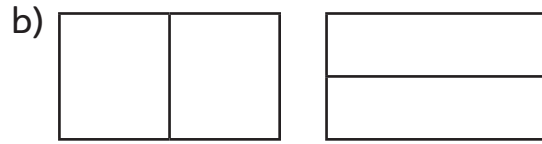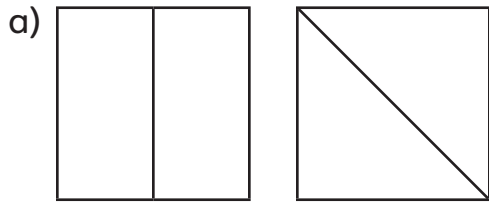b) What is the numerator of the fraction? _____

c) How many seats are on the bus? _____

d) How many students are seated on the bus? _____
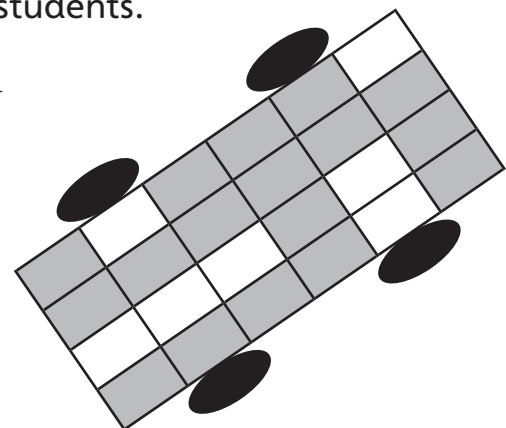
1. Shade one half of the shape in two different ways.

a)

b)

c)

d)

e)

f)

2. Write "yes" or "no" to answer the question for each part in Question 1.

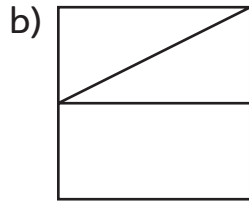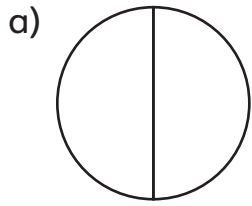a) Are the fractions the same?

b) Do the equal parts look the same?

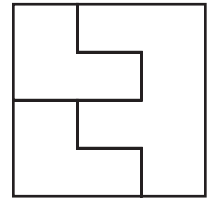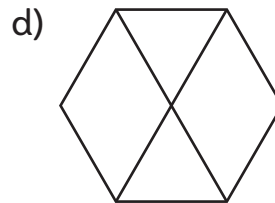**3.** Shade one fourth of the shape in different ways.

a)

b)
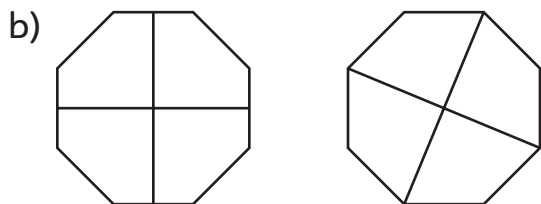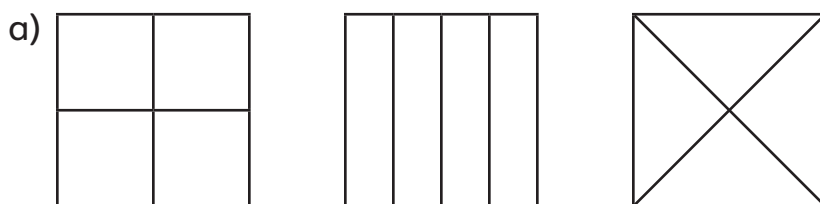
4. Write "yes" or "no" to answer the question for each part in Question 3.

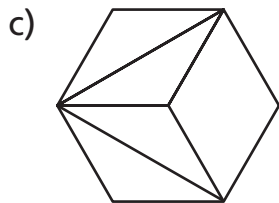a) Are the fractions the same?

b) Do the equal parts look the same?

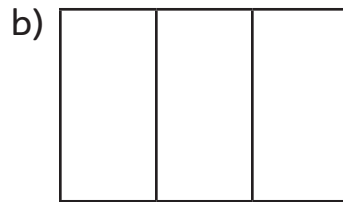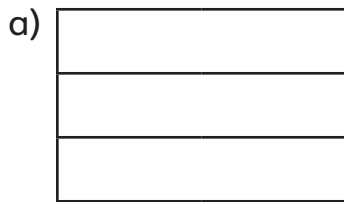**5.** Add a line to the picture to make 4 equal parts.
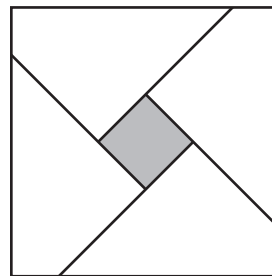
a)

b)

BONUS ▶

6. Add a line to the picture to make 6 equal parts.

a)

b)

c)

d)

7. Jun must shade in one fifth of the big square.

Is his answer correct? _____

Explain. _____

_____

_____

_____

BONUS ▶ Show two different ways to divide a rectangle into 8 equal rectangles.