## Rising $8^{\text {th }}$ Grade Summer Math Packet

Concept 1 - Proportional Reasoning (7.RP.1, 7.NS. 2 (d), 7.NS.3, 7.EE. 4 (a), 7.G.1, 7.RP. 2 (a,b,c,d), 7.RP.3, 7.EE.3)

Unit Rate - $\qquad$
To determine the unit rate for given values, $\qquad$ the values Ratio - Comparison of two $\qquad$ , represents $\qquad$
Proportional Relationship - A relationship in which every pair of values has the same $\qquad$
Representations of ratios: Consider this situation: At a store, every book costs $\$ 3$.

Fraction:


Table (If ratios are equal, the relationship is $\qquad$ ):

| Number of <br> Books | Price (in <br> dollars) |
| :---: | :---: |
| 1 | 3 |
| 3 | 9 |
| 4 | 12 |
| 7 | 21 |

Colon:
$\qquad$ : $\qquad$
Graph:


## Points:

| $\mathbf{X}$ | $\mathbf{Y}$ |
| :---: | :---: |
| $\mathbf{0}$ | $\mathbf{0}$ |
| $\mathbf{1}$ |  |
|  | 6 |
| 3 |  |

Equation: $\mathrm{x}=$ $\qquad$ , $y=$ $\qquad$

$$
y=\ldots x
$$

## Common Ratios

Speed $=$ $\qquad$ Cost Per Item $=$ $\qquad$

Pay Rate $=$ $\qquad$ Scale Models = $\qquad$

## Percents

- A percent is a ratio out of $\qquad$ used to compare numbers.
- To find the percent error or percent change between two values:

$$
\% \text { Change }=\frac{\text { New Value }- \text { old Value }}{\text { Old Value }} \cdot 100 \quad \% \text { Error }=\frac{\text { Actual Value }- \text { Expected Value }}{\text { Expected Value }} \cdot 100
$$

- When solving word problems involving percent change, carefully read the problem to determine if the change is an $\qquad$ (like a tax, raise, tip, or commission) or $\qquad$ (like a discount, depreciation, or sale).
- Then, a visual model and/or equation can help solve it. For example:

A shirt costs $\$ 25.74$ after a $7 \%$ tax. What is the price of the shirt before tax?

Visual Model

| 0.07• <br> Original <br> Price (p) | Original Price (p) |
| :--- | :---: |
| Total Price (\$25.74) |  |

Equation
$0.07 \mathrm{p}+\mathrm{p}=25.74$

## Higher-Level Questions for Discourse

1. What is one visual and one mathematical way you can tell if a relationship is proportional?
2. Why do you "move the decimal" two places to write a percent as a decimal?

Concept 1 Released EOG Questions (7.RP.1, 7.NS. 2 (d), 7.NS.3, 7.EE. 4 (a), 7.G.1, 7.RP. 2 (a,b,c,d), 7.RP.3, 7.EE.3)

1 The table shows how much a store charges for certain numbers of pencils.

| Number of pencils $(p)$ | Cost $(c)$ |
| :---: | :---: |
| 4 | $\$ 0.72$ |
| 7 | $\$ 1.26$ |
| 12 | $\$ 2.16$ |

Based on the table, which equation could be used to calculate the cost, $c$, of any number of pencils, $p$ ?
A) $\mathbf{c}=.09 \mathrm{p}$
B) $\mathbf{c}=.18 \mathrm{p}$
C) $c=.54 p$
D) $c=.72 p$

2 Suppose that a butterfly can fly 82 feet in 4 seconds. A dragonfly can fly 50 feet in 2 seconds. Which can fly faster and by how much?

A The dragonfly is 4.5 feet per second faster.
B The dragonfly is 20.5 feet per second faster.
C The butterfly is 4.5 feet per second faster.
D The butterfly is 24 feet per second faster.

3 Chad built a scale model of a statue. He built the model 7 inches tall to represent the actual height of 15 feet. Which equation below represents the relationship between the actual height (a), in feet, and the height of the model ( $m$ ), in inches?

A $\quad a=\frac{7}{15} m$
B $m=\frac{7}{15} a$
C $a=0.75 m$
D $\quad m=0.75 a$
Michelle bought the same fabric on 3 different occasions and recorded the data below.

| Yards of Fabric | Total Cost |
| :---: | :---: |
| 2.2 | $\$ 2.53$ |
| 3.6 | $\$ 4.14$ |
| 4.2 | $\$ 4.83$ |

What was the price per yard of fabric?
A) $\$ 1.05$
B) $\mathbf{\$ 1 . 1 0}$
C) $\$ 1.15$
D) $\$ 1.50$

Mike earned the amounts listed in the table below.

| Hours Worked $(h)$ | Amount Earned $(E)$ |
| :---: | :---: |
| 15 | $\$ 183.75$ |
| 22 | $\$ 269.50$ |
| 26 | $\$ 318.50$ |

Which equation could be used to find the amount of money Mike earns, $E$, for any number of hours worked, $h$ ?
A $\quad E=18.75+h$
C $\quad E=18.75 h$
B $\quad E=12.25+h$
D $E=12.25 h$

John mixed $\frac{3}{4}$ liter of yellow paint with $1 \frac{1}{4}$ liters of red paint to make 2 liters of orange paint.

- He needed more orange paint.
- To make a new batch of orange paint, he used exactly 1 liter of red paint.

Using the same ratio, how many liters of yellow paint should John use to make the new batch of orange paint?

9 One lap around a track is equal to one-eighth of a mile. A horse ran adistance of 9 laps in 2 minutes and 30 seconds. What was the horse's average speed in miles per minute?

A store sells ladders.

- The retail price was a 40 percent markup over the manufacturer price.
- A month later, the store reduced the retail price of the ladder by 25 percent.

What percent markup is the new retail price over the manufacturer price?
A notebook costs $\$ 4.50$ plus sales tax. After sales tax, the notebook is $\$ 4.86$. What is the sales tax rate?
A) $\mathbf{6 \%}$
B) $\mathbf{7 \%}$
C) $\mathbf{8 \%}$
D) $\mathbf{9 \%}$

The Smith family went out to dinner.

- $\quad$ The price of the meal was $\$ 29.85$.
- The sales tax was $6 \%$ of the price of the meal.
- The tip was $15 \%$ of the meal and the sales tax.

How much money did the Smith family pay for the meal, including tax and tip?
A) $\mathbf{\$ 5 0 . 8 5}$
B) $\$ 36.39$
C) $\mathbf{\$ 3 6 . 1 2}$
D) $\$ 31.95$

Mr. Sanchez bought 2 magazines for $\$ 9.95$ each and 1 book for $\$ 14.95$. If the sales tax is $6 \%$, what is the total cost of Mr. Sanchez's purchases?
A) $\$ \mathbf{2 5 . 5 0}$
B) $\$ 26.39$
C) $\$ \mathbf{3 5 . 4 5}$
D) $\$ \mathbf{3 6 . 9 4}$

Two sporting goods stores are having discount sales on basketballs.

- At one store, a basketball is on sale for $20 \%$ off the regular price of \$24.95.
- At the other store, the same kind of basketball is on sale for $25 \%$ off the regular price of $\$ 25.80$.

What is the difference between the sale prices of the two stores?
A) $\$ 0.61$
B) $\$ 0.85$
C) $\$ 1.46$
D) $\$ 2.89$

Concept 2 - Rational Number Operations (7.NS. 1 (a,b,c,d), 7.NS.3, 7.EE.3, 7.NS. 2 (a,b,c))

## Adding and Subtracting with Negatives

You have $\$ 2.75$ in your pocket, but you owe your friend $\$ 4.50$. How much more do you need to pay him?

## Draw a Picture $\quad$ Number Line Representation Addition Rules

You have $21 / 2$ cups of flour. A recipe for your friend's birthday cake needs $21 / 2$ cups of flour. How much flour do you have left after baking the cake?

Draw a Picture $\quad$ Number Line Representation $\quad$ Addition Rules

Review: Fraction Operation Rules


Operations with Negatives Rules

## OPERATIONS WITH INTEGERS

## ADDITION

When addends have the same shan, add. Use that sign when you write the sum.

$$
\begin{aligned}
5+8 & =13 \\
-20+-30 & =-50
\end{aligned}
$$

When adsends have different shign, subterat. Une the sign at the grester addend.
$-6+4=-2$

$$
45+-10=35
$$



MULTIPLICATION
When the factors have the same sign, the product is poritive.

$$
\begin{array}{r}
5 \times 6=30 \\
-13 \times-3=39
\end{array}
$$

When the factors have different uigns, the prodect is negative.

$$
\begin{array}{r}
-6 \times 8=-48 \\
9 \times-11=-99
\end{array}
$$

## SUBTRACTION

To wabtract an integer, add its opposite.
The opposike of 12 is " 12 .
$4-12=4+-12=-8$
$9--12=9+12=21$
The opposite of -15 is is.
$1-715=1+15=16$
$-20-* 15=* 20+15=* 5$

DIVISION
When the dividend and the divisor have the same sign, the quotient is poritive.

$$
\begin{aligned}
45 \div 9 & =5 \\
-120 \div-6 & =20
\end{aligned}
$$

When the dividend and the diviser have different signs, the quotient is negative.

$$
\begin{aligned}
35 \div-5 & =-7 \\
-250 \div 10 & =-25
\end{aligned}
$$

Exponents and Order of Operations:
$4^{3}=\ldots \quad{ }^{\bullet} \quad$.__ When evaluating expressions, exponents after $\quad$.
To raise a fraction to an exponent, apply the exponent to the $\qquad$ and $\qquad$ .

## Higher-Level Questions for Discourse

1. Explain, using a real-world situation, why adding two negatives equals a negative.
2. Why do we need a common denominator to add fractions but not to multiply fractions?

## Concept 2 Released EOG Questions (7.NS.1 (a,b,c,d), 7.NS.3, 7.EE.3, 7.NS. 2 (a,b,c))

6
A baker made two cakes of the same size.

- At the end of the day, there was $\frac{2}{3}$ of a chocolate cake left.
- There was $\frac{5}{6}$ of a strawberry cake left.
- The baker divided the remaining chocolate cake into 2 equal pieces and the remaining strawberry cake into 3 equal pieces.

Which cake flavor had larger pieces and by how much?
A chocolate by $\frac{1}{6}$ of a cake
B strawberry by $\frac{1}{6}$ of a cake
C chocolate by $\frac{1}{18}$ of a cake
D strawberry by $\frac{1}{18}$ of a cake

Betty makes pies. To make 6 pies, she uses $7 \frac{1}{2}$ cups of flour. How many cups of flour are needed to make 1 pie?

Mr. Adams had 24 guests at his house for a party. Each guest brought one item.

- One-third of the guests brought drinks.
- One-fourth of the guests brought a dessert.
- The rest of the guests brought chips.

How many guests brought chips?

13 What is the value of $-2\left(4^{2}+\left(\frac{1}{2}\right)^{2}\right)$ ?

20 Anna saved $\$ 20$ in a jar each month for $2 \frac{1}{2}$ years. She spent $75 \%$ of her savings on a computer. How much money did Anna have left in the jar?
A) $\$ 150$
B) $\$ 240$
C) $\$ 450$
D) $\$ 600$

Concept 3 - Expressions, Equations, and Inequalities (7.EE.1, 7.EE.2, 7.EE.4(a, b))
Simplifying Expressions

Distributive Property FIRST

$5 x+30$

THEN Combine Like Terms


For Example:


You Try: $\quad 2(3 a-b)-7(-2 a+3 b) \quad 2(\mathrm{x}+4)+3(\mathrm{x}-5)-2 \mathrm{y}$

## Expressions with Percents

The percentage that represents a whole is $\qquad$ . So to add or subtract a percent of a value, we add or subtract the percent from $\qquad$ _.

As a decimal to perform operations, $100 \%=$ $\qquad$ . After we convert our percent to a decimal, we can add or subtract it from $\qquad$ .

Example: A CD costs $\$ 15.95+7 \%$ sales tax. What expression represents the total cost? What is the cost?

What would be the cost if the CD's price was $x$ ?

## Setting Up and Solving Equations

Let's say you go to the store with $\$ 20$. Sodas cost $\$ 2$ each. How many sodas can you buy? (Set up AND solve the equation.)

The next time you go to the store with $\$ 20$, you decide to buy a box of cookies for $\$ 4$ and then buy sodas with the rest of the money. How many sodas can you buy? (Set up AND solve the equation.)

Finally, you go to the store a third time with $\$ 20$, but you also bring 2 friends. All three of you are getting a box of cookies and sodas with the leftover money. How many total sodas will you be able to buy? (Set up AND solve the equation.)

What is the same and different about solving each of these equations?

Practice:

$$
\begin{array}{ll}
\text { (1) } 7 x+38=157 & \text { (2) } 3+\frac{x}{5}=7
\end{array}
$$

(3) $39+10 x=189$

## Solving Inequalities

The steps for solving inequalities are similar to solving equations, but you have to $\qquad$ when you multiply or divide by a negative.
Practice: 1) $11 \mathrm{q}+5 \leq 49$
$3.5 \mathrm{x}-10>17.5$
$\frac{5}{7} c+\frac{2}{3} \geq 4$

We can graph these solutions on a $\qquad$ , because the answer is a range of values.


Look at the number lines above. What do you notice about the inequality signs and graphs?

Complete the following table with the characteristics of these graphs.

|  | Includes Equal To | Not Equal To |
| :---: | :---: | :---: |
| Greater Than |  |  |
| Less Than |  |  |

Now, graph the solutions to the three inequalities you solved above.


## Higher-Level Questions for Discourse

1. What does it mean to solve an equation or inequality?
2. Why do we add $100 \%$ when something increases by a percentage?

## Concept 3 Released EOG Questions (7.EE.1, 7.EE.2, 7.EE.4(a, b))

$\overline{S U}$ intersects $\overline{T V}$ at point $R$. What is the value of $x$, in degrees? 19

Which expression is equivalent to $-4(x+2)-\frac{1}{2}(2 x-6)$ ?


A $-5 x-4$
B $\quad-5 x-5$
C $-8 x-4$
D $-8 x-5$

Mr. Jones spent $\$ 156$ to attend a college football game.
23 What is the solution to the inequality $-3 x-42>3$ ?

- Twenty percent of this cost was for a parking pass.
- He spent the remainder of the money on two tickets for the game. A $x>-13$

What was the price per ticket?

| A | $\$ 15.60$ | $B$ | $x<-13$ |
| :--- | :--- | :--- | :---: |
| B | $\$ 31.20$ | C | $x>-15$ |
| C | $\$ 62.40$ | D | $x<-15$ |

Evan has a summer job to pick berries on a farm.

- He earns $\$ 2.00$ every 15 minutes that he picks strawberries.
- He earns $\$ 2.40$ for every 15 minutes that he picks blueberries.
- He picked strawberries for an hour and blueberries for 45 minutes.

How much money did Evan earn?
A) $\$ 4.40$
B) $\$ 8.80$
C) $\$ 15.20$
D) $\$ 26.40$

Mr. Tucker earns $\$ 250$ per week working in an appliance store. In addition, he earns $2 \%$ commission on all of his sales. Last week, he sold $\$ 2,800$ worth of appliances. What was Mr. Tucker's total income for the week?
A) $\$ 56$
B) $\$ \mathbf{2 8 7}$
C) $\$ 306$
D) $\$ 467$

Which choice is equivalent to the expression shown below?

$$
-3(3 y-2 x)+2(5 x-4 y)
$$

A $-3 y+2 x$

B $\quad-11 y+6 x$

C $\quad-13 y+8 x$

D $\quad-17 y+16 x$

22
When Derek planted a tree it was 36 inches tall. The tree grew $1 \frac{1}{4}$ inches per year. The tree is now $44 \frac{3}{4}$ inches tall. How many years ago did Derek plant the tree?
A) 7
B) 8
C) 9
D) 10

Which choice is a graph of the solution set for $12-x<8$ ?

B


C


D


Karen spends $\$ 450$ on monthly bills. Of this total amount, $12 \%$ is for phone service, $\frac{1}{10}$ is for Internet service, and $\frac{2}{9}$ is for utilities. If the rest of the total amount is for food, how much does Karen have for food?
A) $\$ 144.00$
B) $\$ 199.00$
C) $\$ 251.00$
D) $\$ 277.00$

Jacob is 12 years younger than twice Elizabeth's age. Jacob is 28 years old. How old is Elizabeth?
A) 8
B) 14
C) 16
D) 20


40 Which expression is equivalent to $2(x-3)+4 x+3$ ?
A $6 x$
B $6 x-3$
C $3 x$
D $\quad-2 x+3$

41 What is the value of $x$ in the equation ${ }^{-2}=5 x+3$ ?
A 1
B $\quad \frac{1}{5}$
C $\quad-1$
D $-3 \frac{2}{5}$

42 Which set of numbers is included in the solution set of $4-3 x<-\underline{\underline{2}}$ ?

A $\quad\{2.5,8,15\}$
B $\quad\{-8,0,1.5\}$
C $\quad\{-15,-8,0\}$

D $\quad\{0,2.5,8\}$

Probability - The likelihood of an event occurring, calculated by dividing $\qquad$

Probability is always between $\qquad$ and $\qquad$ . A probability of $\qquad$ means an event NEVER occurs, and a probability of $\qquad$ means the event ALWAYS occurs. A probability of $\qquad$ means the event has the exact same chance of occurring and not occurring.

Challenge: If you roll one 6 -sided die, can you come up with a situation with a...
Probability of 0 ? Probability of 1 ?
Probability of $1 / 2$ or 0.5 ?
Sample Space - All of the $\qquad$ that can occur from an event. For example, in rolling two dice, the sample space is:

Adding all of the probabilities for a given sample space will equal $\qquad$ , because some event must occur. Probability can also be calculated using area, by dividing $\qquad$

Example: You win a carnival game if you can throw a dart in the square below outside the circle. If one side of the square has a length of 3 feet, what is the probability of winning the game?


## Higher Level Questions for Discourse

1. Why can probability not be less than 0 or higher than 1 ?
2. A coin is flipped 10 times with 8 heads. Can this occur? What would you expect if you flipped the coin 100 times?

32 Jeremy will roll a number cube, numbered 1-6, twice. What is the probability of rolling an even number, then the number 3 ?

A $\frac{1}{12}$
B $\quad \frac{1}{6}$
C $\quad \frac{1}{4}$
D $\frac{2}{3}$

49 Terry placed 6 number tiles labeled 4, 7, 10, 11, 14, and 21 in a box. He will pick one of the number tiles from the box without looking. What is the probability Terry will pick a tile labeled with an even number?

A $\frac{2}{3}$
B $\quad \frac{1}{2}$
C $\quad \frac{1}{3}$
D $\frac{1}{6}$
50 The table below shows the different choices for making a shake at a restaurant. Joey will randomly select one dairy, one fruit, and one topping choice.

| Dairy <br> Choices | Fruit <br> Choices | Topping <br> Choices |  |
| :---: | :---: | :---: | :---: |
| ice cream | pineapple | peanuts |  |
| yogurt | strawberry | granola |  |
|  | banana |  |  |
|  |  |  |  |
|  |  |  |  |

What is the probability that Joey's shake will be made with ice cream, pineapple, and granola?

A $\frac{1}{12}$
B $\quad \frac{1}{6}$
C $\frac{3}{12}$
D $\quad \frac{3}{7}$

Concept 5 - Inferences and Statistics (7.SP.1, 7.SP.2, 7.SP.3, 7.SP.4)
Mean - $\qquad$
Median - $\qquad$
Quartile - $\qquad$
Mean Absolute Deviation (MAD) - $\qquad$

Random Sample - $\qquad$

When comparing data sets, a random sample will give the best comparison as it will produce the most fair data.
From these samples, you can make $\qquad$ , or guesses, about the entire population.

## Higher-Level Questions for Discourse

1. When comparing data sets, how is the information provided by the mean, median, and MAD different?
2. In your own words, what makes a sample "random"?

## Concept 5 Released EOG Questions (7.SP.1, 7.SP.2, 7.SP.3, 7.SP.4)

Hillary and Devin will collect data to find out where the seventh-grade students should take their field trip. Which group should Hillary and Devin survey to collect the best data?

A the first 25 students through the lunch line
B ten random people from each seventh-grade class
C all the students in a dance class
D twenty of their friends

|  | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Week 1 | 30 | 26 | 48 | 34 | 42 | 25 | 48 |
| Week 2 | 32 | 23 | 50 | 32 | 44 | 23 | 218 |

What is the approximate difference in average daily miles between the two weeks?
A) 96
B) 48
C) 34
D) $\mathbf{2 4}$

The chart below shows the number of miles Sam drove each day for two weeks.

Veronica and James are both on a bowling team. Below are their bowling scores.

| Game | Veronica | James |
| :---: | :---: | :---: |
| 1 | 141 | 118 |
| 2 | 159 | 152 |
| 3 | 128 | 129 |
| 4 | 148 | 127 |
| 5 | 136 | 133 |

How much higher is Veronica's median score than James's median score?
A) 12
B) 10
C) 7
D) 3

The table below shows the grades for three students on five assignments.

| Student | Grades |
| :---: | :---: |
| 1 | $77,80,100,75,82$ |
| 2 | $84,92,80,82,85$ |
| 3 | $88,80,79,85,90$ |

Which statement below is true about the mean absolute deviation (MAD) of the students?

A MAD of Student $3=$ MAD of Student 1
B MAD of Student $2=$ MAD of Student 1
C MAD of Student $1<$ MAD of Student 3
D MAD of Student $1>$ MAD of Student 2

## Concept 6 - Shapes and Geometry, 2D and 3D (7.G.3, 7.G.4, 7.G.6)

## Cross Sections

If you cut the prisms below with a plane PARALLEL to the base, what shape do you make? How do you know?


If you cut the prisms below with a plane PERPENDICULAR to the base, what shape do you make? How do you know?


## Circles

Radius - $\qquad$ Diameter - $\qquad$
Area - $\qquad$ Formula for Area - $\qquad$
Circumference - $\qquad$ Formula for Circumference - $\qquad$
П - $\qquad$
All of these measurements can be used to solve problems.
Key Words for Area - $\qquad$
Key Words for Circumference - $\qquad$
Volume and Surface Area
Area - $\qquad$
Area of Rectangle - $\qquad$ Area of Triangle - $\qquad$
Perimeter - $\qquad$
Volume - $\qquad$
Volume of Right Prism (like a box) - $\qquad$ Volume of Pyramid - $\qquad$
Surface Area - $\qquad$

## Higher-Level Questions for Discourse

1. How do the Area and Perimeter of Polygons, Area and Circumference of Circles, and Volume and Surface Area of 3-Dimensional Shapes relate?
2. Why does the area of the base times the height tell us the volume of a prism?

## Concept 6 Released EOG Questions (7.G.3, 7.G.4, 7.G.6)

12 A kitchen is shaped like a rectangle with dimensions of $11 \frac{1}{2} \mathrm{ft}$ by $9 \frac{1}{2} \mathrm{ft}$. The floor of the room is made of square tiles with a side length of $\frac{1}{2} \mathrm{ft}$. What is the number of tiles that will cover the kitchen floor?

A triangular right prism is cut perpendicular to the base. What is the shape of the cross section?
A) Hexagon
B) Rectangle
C) Trapezoid
D) Triangle

The circumference of a circle is 188 meters. What is the approximate radius of the circle?
A) $\mathbf{3 0} \mathbf{m}$
B) $\mathbf{6 0} \mathrm{m}$
C) $\mathbf{9 4} \mathbf{~ m}$
D) $\mathbf{1 2 8} \mathbf{~ m}$

Laura's yard is in the shape of a square and a half-circle.


A $\quad 316 \mathrm{~m}^{2}$
B $\quad 402 \mathrm{~m}^{2}$
C $\quad 516 \mathrm{~m}^{2}$
D $743 \mathrm{~m}^{2}$

What is the approximate area of Laura's yard?

What is the approximate circumference of the circle that has a center at $(2,1)$ and passes through the point $(2,5)$ ?
A) 8 units
B) $\mathbf{1 3}$ units
C) 25 units
D) $\mathbf{5 0}$ units

What is the surface area of the figure below?


A $\quad 12 \mathrm{ft}^{2}$
B $\quad 36 \mathrm{ft}^{2}$
C $\quad 54 \mathrm{ft}^{2}$
D $\quad 90 \mathrm{ft}^{2}$

What is the volume of this triangular right prism?


A $\quad 165 \mathrm{ft}^{3}$
B $\quad 330 \mathrm{ft}^{3}$
C $1,073 \mathrm{ft}^{3}$
D $2,145 \mathrm{ft}^{3}$

## Concept 7 - Scale Drawings and Construction (7.G.1, 7.G.2, 7.G.5)

## Scale Drawings

Scale drawings have $\qquad$ sides to the actual figures, so they have equal $\qquad$ .

To find missing lengths of sides, we can set up a $\qquad$ or corresponding sides.

Example: If the rectangle below is enlarged using a scale factor of 1.5 , what will be the perimeter and area of the new rectangle?

7 in.
2 in. $\square$

## Angle Relationships

Supplementary Angles - $\qquad$ Complementary Angles - $\qquad$
Vertical Angles - $\qquad$
Adjacent Angles - $\qquad$


If two adjacent angles form a straight line with the other side, they add to $\qquad$ .

## Triangle Relationships

The angles of a triangle add to $\qquad$ . In an isosceles triangle, $\qquad$ and $\qquad$ are equal.

In an equilateral triangle, all $\qquad$ and $\qquad$ are equal.

What is the measure of each angle in an equilateral triangle? How do you know?

Any two sides of a triangle must add to be $\qquad$ than the third. What happens if you try to draw a triangle with sides 1 inch, 2 inches, and 3 inches?

## Higher-Level Questions for Discourse

1. What other major concept do scale drawings relate to? How do they relate?
2. Can a triangle have two right angles or two obtuse angles? Why or why not?

## Concept 7 Released EOG Questions (7.G.1, 7.G.2, 7.G.5)

14 Brett made a scale drawing of a rectangular room in his house. The actual length of the room is $12 \frac{4}{5} \mathrm{ft}$. The scale used to make the drawing was $\frac{1}{4} \mathrm{in} .=1 \mathrm{ft}$. What is the length, in inches, of the room on the drawing?

28 Joe's bathroom floor is 5 feet wide and 8 feet long. He will cover the floor with 3 -inch square tiles. How many tiles does Joe need?
A) $\mathbf{1 2 0}$
B) 160
C) $\mathbf{3 6 0}$
D) 640

43 Laurie will draw a scale model of the garden she wants to plant. Her scale will be $1 \mathrm{~cm}=2.5 \mathrm{ft}$.

8.5 cm

What will be the actual dimensions of Laurie's garden?

A $\quad 1.6 \mathrm{ft}$ by 3.4 ft
B $\quad 4 \mathrm{ft}$ by 34 ft
C 8 ft by 34 ft
D $\quad 10 \mathrm{ft}$ by 21.25 ft

25 Which choice shows three lengths that cannot be the lengths of the three sides of a triangle?

A $\quad 2 \mathrm{~cm}, 8 \mathrm{~cm}, 8 \mathrm{~cm}$
B $\quad 2 \mathrm{~cm}, 3 \mathrm{~cm}, 6 \mathrm{~cm}$
C $\quad 4 \mathrm{~cm}, 5 \mathrm{~cm}, 7 \mathrm{~cm}$
D $5 \mathrm{~cm}, 6 \mathrm{~cm}, 9 \mathrm{~cm}$
27 Angles $T$ and $V$ are complementary. Angle $T$ has a measure of $(2 x+10)^{\circ}$. Angle $V$ has a measure of $48^{\circ}$. What is the value of $x$ ?
A) $\mathbf{1 6}{ }^{0}$
B) $\mathbf{1 9}^{\mathbf{0}}$
C) $\mathbf{2 6}{ }^{0}$
D) $\mathbf{4 2}^{\mathbf{0}}$

