SAMPLER

CRS Middle School Math

(College-Readiness Standards)

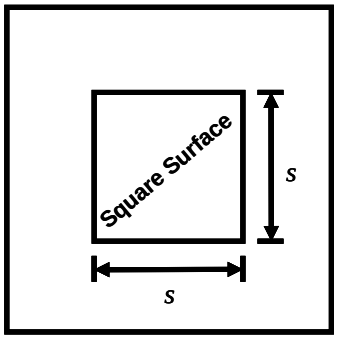
Level F – Grade 6

Level G – Grade 7

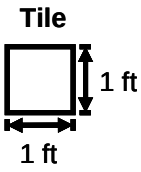
Level H – Grade 8

LEVEL F: CRS COMPREHENSIVE PERFORMANCE TASKS

3 Mr. Gorman wants to place a border around a square surface. The square surface has an edge that is *s* feet long. He decided to write an expression to determine the number of tiles he will need in order to create the border. The border of the square surface will be made of tiles that are 1-foot by 1-foot. In order to illustrate the problem he made the drawing below.



Note: Not drawn to scale.



Note: Not drawn to scale.

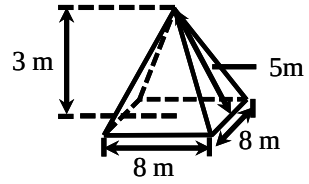
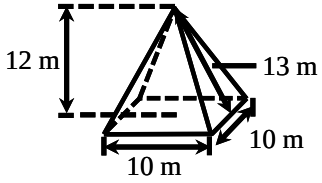
A. Write an expression that shows the number of tiles Mr. Gorman will need to create the border.

B. How many tiles will he need to create a border for a square surface that measures 7 feet by 7 feet?

LEVEL F
Geometry # 4

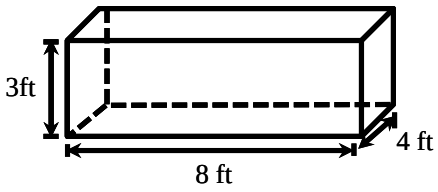
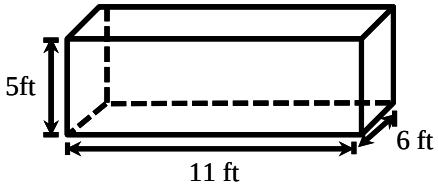
Part A Using the appropriate reference sheet, calculate the total surface area of the **pyramids** below.

Note: Figures not drawn to scale.

	Figure	Surface Area
1)		
2)		

Part B Using the appropriate reference sheet, calculate the total surface area of the ***prisms*** in the table below.

Note: Figures not drawn to scale.

	Figure	Surface Area
3)		
4)		

LEVEL F: *QUIK-PIK # 8*

1. Complete the table.

Fraction	a) $\frac{1}{10}$	b) $\frac{}{5}$	c) $\frac{1}{4}$	d) $\frac{1}{2}$
Decimal		0.2		
Percent			25%	

2. Simplify each pair of fractions before dividing them.

a) $\frac{3}{24} \div \frac{45}{5} =$

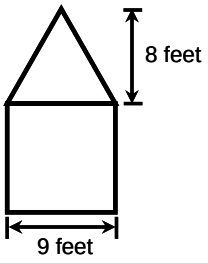
b) $\frac{7}{70} \div \frac{14}{2} =$

3. Lori is studying a solid substance in a lab. The starting temperature of the substance was 0 °F. Every second the temperature of the solid substance rises one-tenth of a degree. What was the temperature of the substance after 200 seconds?

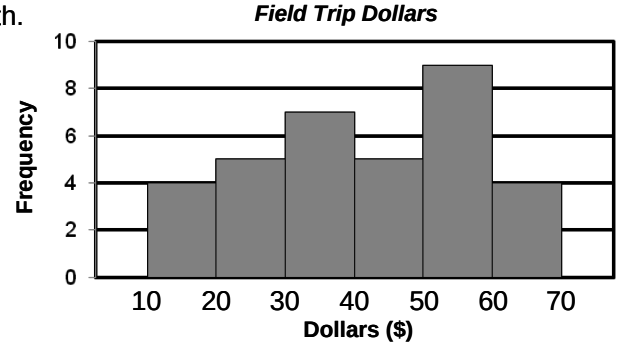
Answer:_____

4. Calculate the area, in square feet, of the figure below that is composed of a triangle and a square.

Note: Figure <u>not</u> drawn to scale.

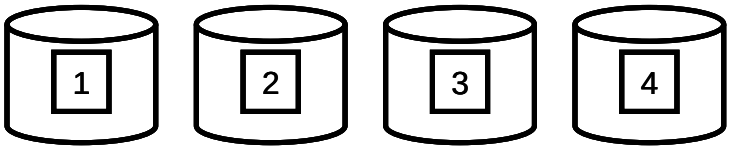


5. The histogram shows the amount of dollars that students brought on a field trip. What percent of the students brought between 30 and 50 dollars? Round to the nearest tenth.



LEVEL F: *QUIK-PIK # 10*

1. Your teacher gives you some cards to place in four different containers. He gives you hints about the number of cards that go in each container so that you can put the correct number of cards inside.



A) Container #1 has 14 cards. Container #1 has 35% of the cards. What is the total number of cards in all four boxes?

Answer: _____

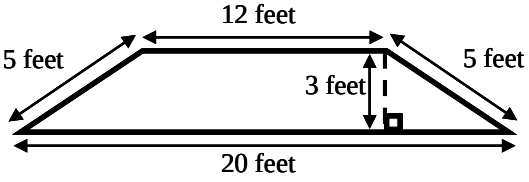
B) Container #2 gets $\frac{3}{20}$ of the cards. Lisa says that she can use a ratio table to figure out how many cards are in container #2. Kendrick says that it is not possible to find the amount of cards in container #2. Who is correct?

Answer: _____

If you think Lisa is correct, show the ratio table to figure out how many cards are in container #2. Write your answer in a complete sentence below. If Kendrick is correct, explain why. Then show another way to find out how many cards are in container #2 and write your answer in a complete sentence below.

Answer: _____

39 The top of a table in the back of Ms. Wynwood's room is shaped like a trapezoid, as shown below.



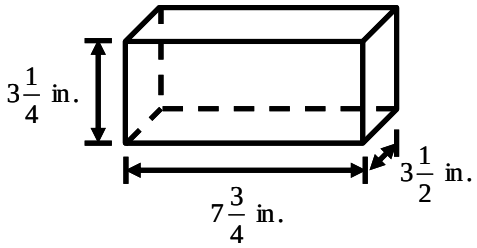
Note: Figure not drawn to scale.

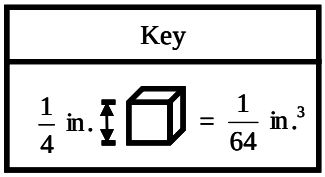
What is the area of the top of the table?

Ⓐ 48 square feet
Ⓑ 24 square feet
Ⓒ 20 square feet
Ⓓ 18 square feet
Ⓔ NH

40 Rachel has a box. The dimensions of the box are given below. The key shows the volume of a cube whose edges measure $\frac{1}{4}$ of an inch.

What is the volume of the box, in cubic inches?





Note: Figure not drawn to scale.

Ⓐ $85\frac{8}{32}$ in.^{3} Ⓑ $86\frac{10}{32}$ in.^{3} Ⓒ $88\frac{5}{32}$ in.^{3} Ⓓ $88\frac{10}{32}$ in.^{3} Ⓔ NH

LEVEL F: PRE/POST ASSESSMENT
(CRS-Placement)

40) Ms. Talladega had 6 pounds of sugar. She divided it in $\frac{1}{2}$-pound portions.
How many portions did she make?

Ⓐ 2 Ⓒ 6
Ⓑ 4 Ⓓ 12 Ⓔ 14

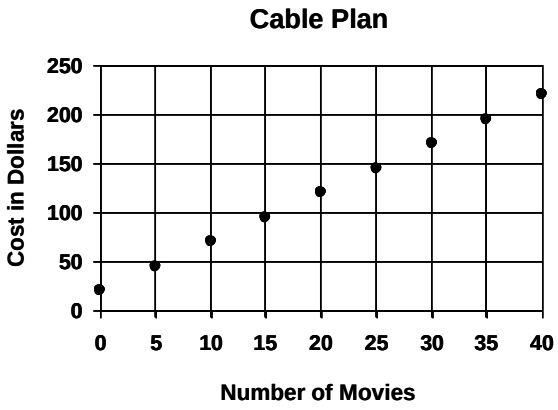
41) Jared will spend a total of 5 hours working out. He switches exercises $\frac{1}{4}$-hour at a time.
How many times will he switch exercises?

Ⓐ 1 Ⓒ 10
Ⓑ 5 Ⓓ 15 Ⓔ 20

42) Tony's bank account has a balance of 70 dollars.
Which of the following is less than 70 dollars?

Ⓐ $90 Ⓒ $70
Ⓑ $85 Ⓓ $65 Ⓔ $83

3 The monthly cost of Andy's cable plan is plotted on the grid below. His friend Barry selected a plan that charges $2.50 per movie, with no monthly fee, since he only watches movies.



A. Write an equation to represent the monthly cost for Barry's plan for any number of movies.

B. Graph the monthly cost of Barry's plan on the grid above.

C. When one of the boys doubles the number of movies he watches, the cost doubles as well. Who is it?

Explain how you know.

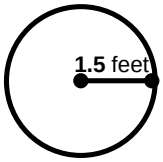
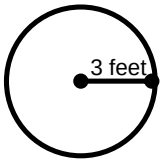
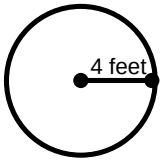
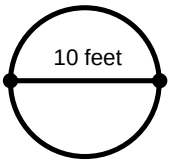
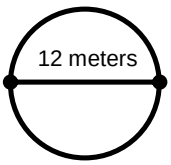
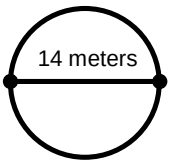
LEVEL G
Geometry # 4

Calculate the circumference and area of the circles below.

Note: $\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$.

Formula: $C = 2\pi r$, where C is the circumference and r is the radius.

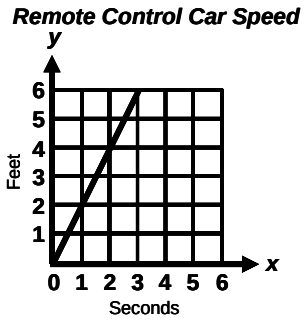
Formula: $A = \pi r^2$, where A is the area and r is the radius.

	Circle	Circumference	Area
Ex.	 r = **1.5** feet	$C = 2(3.14)(\mathbf{1.5})$ $C = 9.42$ feet	$A = (3.14)(\mathbf{1.5})^2$ $A = 7.07$ feet^2
1)	 r = ____feet		
2)	 r = _____		
3)	 r = _____		
4)	 r = _____		
5)	 r = _____		

LEVEL G: *QUIK-PIK # 3*

1. The graph shows the number of feet a remote control car travels every second.

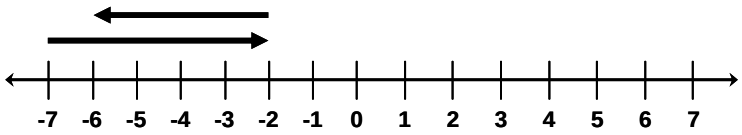
   How many feet does the remote control car travel per second?



Ⓐ 1 foot Ⓒ 3 feet

Ⓑ 2 feet Ⓓ 4 feet Ⓔ 6 feet

2. Which of the expressions below represent the computations indicated by the graph?



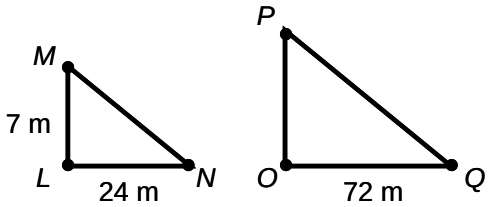
Ⓐ -7 + 5 – 4 Ⓑ 7 + 5 – 4 Ⓒ -7 + 5 + 4 Ⓓ -7 – 5 – 4 Ⓔ 7 + 5 + 4

3. Solve the following equation for x: $18 = \frac{x}{2}$.

   Answer: _____

4. ΔLMN is similar to ΔOPQ.

   What is the measure of side $\overline{OP}$?



   Answer: _____

Note: Figures not drawn to scale.

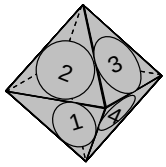
5. A survey determined that 5% of children have asthma in the United States. There are 300 children at a school.

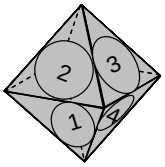
   What is a good estimate for the number of children at the school who have asthma?

Ⓐ 15 Ⓑ 20 Ⓒ 25 Ⓓ 30 Ⓔ 35

LEVEL G: *QUIK-PIK #15*

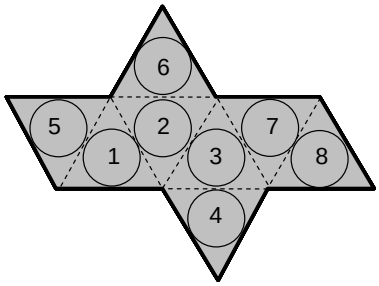
1. An octahedron is a geometric solid with eight faces. All of the faces are equilateral triangles. Vicky has created a game using two octahedrons with numbers on the faces.



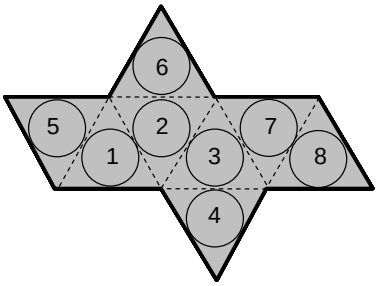


Below are the eight faces of each of the two numbered octahedrons.

Octahedron #1



Octahedron #2



A) How many pairs of numbers can Vicky roll with the two octahedrons?

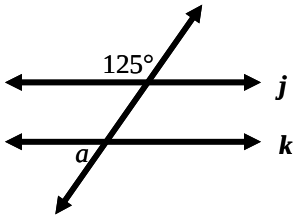
Answer: _____

B) If the sum of the numbers on the octahedrons is greater than 12, the person rolling the octahedrons wins the toss. What is the probability that the sum of the numbers on the two octahedrons will be greater than 12? Show your work.

Answer: _____

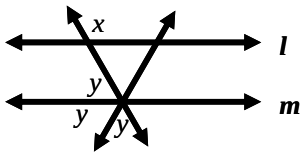
31 Lines *j* and *k* are parallel. What is the measure of $\angle a$?

Ⓐ 53°
Ⓑ 54°
Ⓒ 55°
Ⓓ 110°
Ⓔ 125°

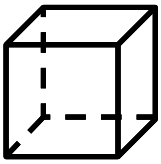


32 Lines *l* and *m* are parallel. What is the measure of $\angle x$?

Ⓐ 60°
Ⓑ 75°
Ⓒ 110°
Ⓓ 119°
Ⓔ 120°



33 Jenny sketched a cube. The length of an edge was 7 cm.
What was the volume of the cube, in cubic centimeters?



Ⓐ 10 cm^3
Ⓑ 21 cm^2
Ⓒ 343 cm^2
Ⓓ 343 cm^3
Ⓔ 700 cm^3

LEVEL G: PRE/POST ASSESSMENT (CRS-Placement)

40) What is the least common denominator for $\frac{2}{5}, \frac{4}{15}, \frac{4}{9}$?

Ⓐ 45 Ⓒ 15
Ⓑ 36 Ⓓ 5 Ⓔ 0

41) Celia collected $10 a day for 21 days. She donated all the money she collected, evenly, to 3 charities.

Which number sentence can you use to find how much money each charity received?

Ⓐ ($10 + 21) × 3 = *n* Ⓒ ($10 × 21) + 3 = *n*
Ⓑ ($10 + 21) – 3 = *n* Ⓓ ($10 × 21) ÷ 3 = *n* Ⓔ 7 = 7

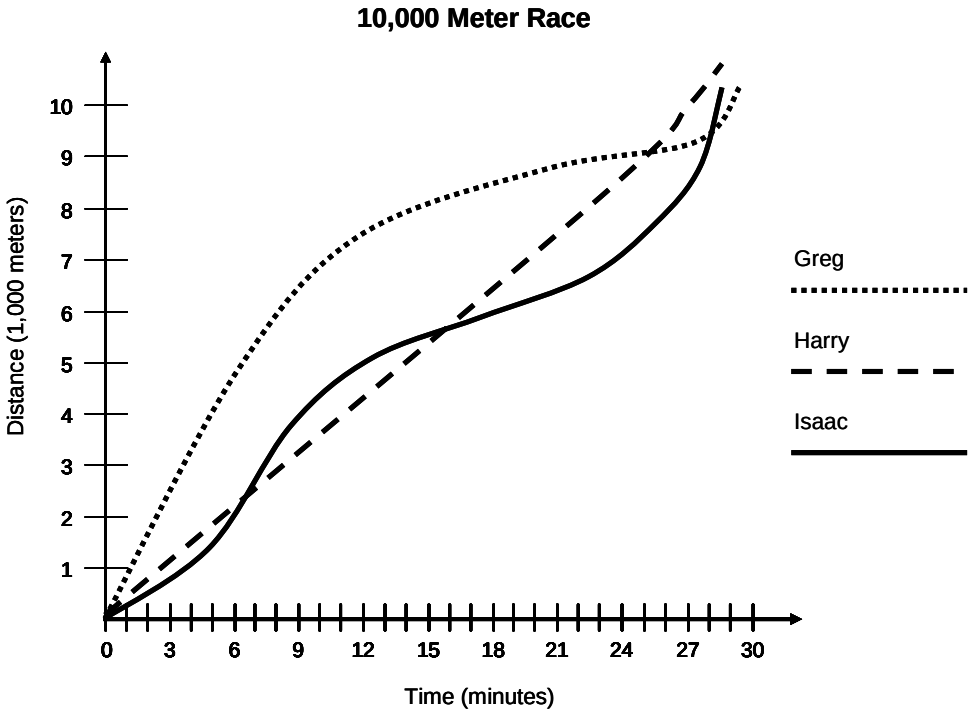
42) Which number sentence can be used to express the statement below?

"The product of a number and 8 is 48."

Ⓐ *x* + 8 = 48 Ⓒ *x* ÷ 8 = 48
Ⓑ *x* • 8 = 48 Ⓓ *x* – 8 = 48 Ⓔ *x* – 48 = 8

LEVEL H: CRS COMPREHENSIVE PERFORMANCE TASKS

5 Greg (Dots), Harry (Dashes) and Isaac (Solid) finished in the top three spots for the 10,000 meter race. The graph below shows their position at various points in the race.



A. Which runner was last between the 9 minute and 12 minute mark?

B. Which runner reached the 7,000 meter mark last?

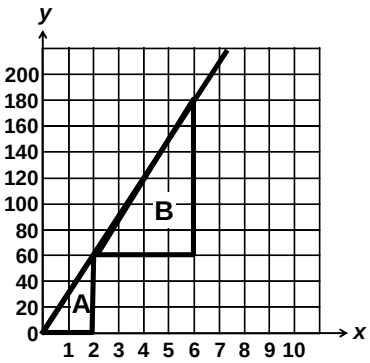
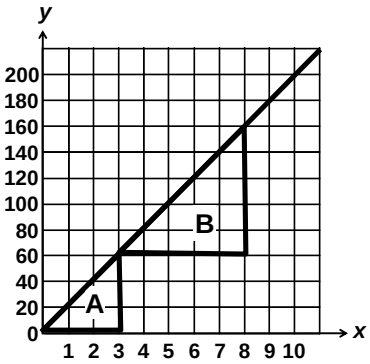
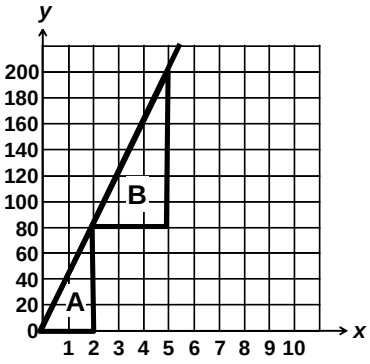
C. When was the last tie during the race?

D. What was the winning time?
Explain or show how you got your answer.

E. What was the average speed for the winner in miles per hour?
Explain how you got your answer.

LEVEL H
Expressions and Equations # 7

Find the ratio of the height and width for each triangle and compare it to the slope.

	Graph	Answer
1)		$\frac{\text{triangle A height}}{\text{triangle A width}} = \_\_\_\_$ $\frac{\text{triangle B height}}{\text{triangle B width}} = \_\_\_\_$ slope = ———
2)		$\frac{\text{triangle A height}}{\text{triangle A width}} = \_\_\_\_$ $\frac{\text{triangle B height}}{\text{triangle B width}} = \_\_\_\_$ slope = ———
3)		$\frac{\text{triangle A height}}{\text{triangle A width}} = \_\_\_\_$ $\frac{\text{triangle B height}}{\text{triangle B width}} = \_\_\_\_$ slope = ———

LEVEL H: *QUIK-PIK #16*

1. Between which two whole numbers is $\sqrt{69}$ located?

Ⓐ 8 and 9 Ⓑ 7 and 8 Ⓒ 6 and 7 Ⓓ 5 and 6 Ⓔ 4 and 5

2. Find the value of f when $T = 0.05$.

$$T = \frac{1}{f}$$

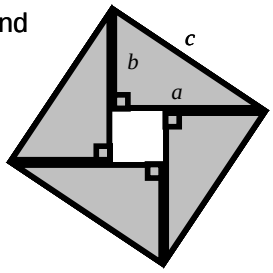
Answer:_____

3. Maggy had a $60 gift certificate to go out to dinner for her birthday. The cost of food and drinks is c, where $c \geq \$60$. If Maggy uses the gift certificate and leaves a tip of 20% of the cost of food and drinks, what equation can be used to find, T, the total amount she paid for the meal before taxes? Mark all that apply.

Ⓐ $T = c + 0.20c$ Ⓒ $T = (c - 60)$

Ⓑ $T = (c - 60) + 0.20c$ Ⓓ $T = (c + 60) + 0.20c$ Ⓔ $T = 1.20c - 60$

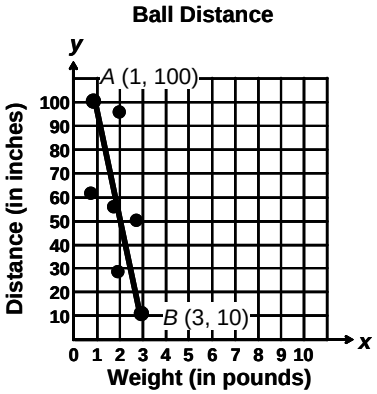
4. What is the area of the smaller square if $a = 4$ and $b = 3$?



Answer:_____

5. The line of best fit graphs the relationship for the weight of a ball and the distance it is thrown.

According to the line of best fit by how much does the distance decrease for each pound of increase?



Answer:_____

LEVEL H: *QUIK-PIK #25*

1. Patrick likes to run from his home to the park. He uses his Smartphone to track the time and distance that he travels during his run. The table shows the data he recorded during his run on the previous day.

Time (minutes)	Distance (miles)
2	0.369
4	0.619
6	1.019
8	1.319
10	1.724
12	2.088
14	2.585

A) Write an algebraic equation to model the data Patrick collected. Explain why you chose your model.

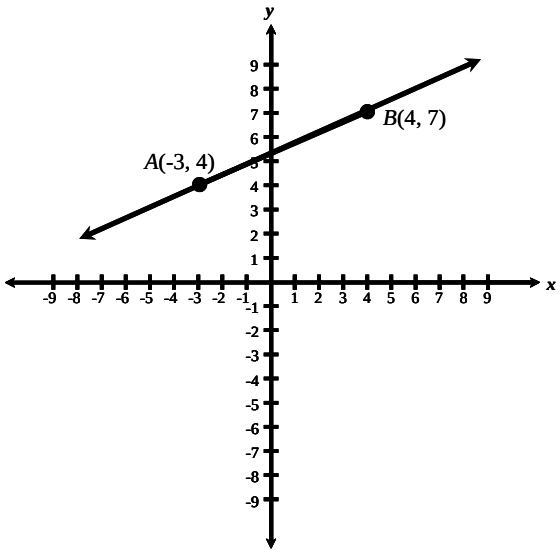
B) Does the data represent a proportional relationship? Explain your reasoning.

C) If Patrick continues at his pace how long will it take him to travel 6 miles? Explain your answer.

20 Function A is represented by the table below.

x	y
-7	0
0	2
21	8
28	10
42	14

Function B is represented by the graph below.



What is the slope for the function with the larger slope?

Ⓐ $\frac{2}{7}$

Ⓑ $\frac{7}{2}$

Ⓒ $\frac{3}{7}$

Ⓓ $\frac{7}{3}$

Ⓔ $\frac{3}{4}$

Continue

LEVEL H: PRE/POST ASSESSMENT
(CRS-Placement)

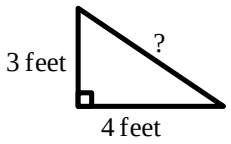
46) There are 2.63×10^3 marbles in a box. They will be put into cylinders. Each cylinder can hold 263 marbles.

What is the total number of cylinders that will be needed?

Ⓐ 10 Ⓒ 1,000

Ⓑ 100 Ⓓ 10,000 Ⓔ 100,000

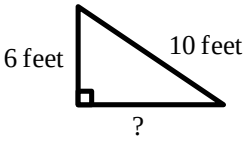
47) What is the measure of the missing side in the triangle below?



Ⓐ 3 feet Ⓒ 5 feet

Ⓑ 4 feet Ⓓ 6 feet Ⓔ 7 feet

48) What is the measure of the missing side in the triangle below?



Ⓐ 9 feet Ⓒ 7 feet

Ⓑ 8 feet Ⓓ 6 feet Ⓔ 5 feet

MATH BUILD-UP #11

Grade 6: ADDING/SUBTRACTING FRACTIONS

Quik-Points℠: 1) When **adding** or **subtracting** fractions make sure the denominators are the same.

2) If a fraction is being added to a whole number, change the whole number into a fraction. Example: $7+\frac{2}{5}=\frac{7}{1}+\frac{2}{5}$

Example: $\frac{1}{6}+\frac{2}{9}$

$\frac{1\times3}{6\times3}=\frac{3}{18}$ $\quad \frac{4}{18}=\frac{2\times2}{9\times2}$

1) Find the Least Common Denominator (LCD). **(See Math Build Up #3)**
LCD = 18
2) Create equivalent fractions with **18** as the denominators.
3) **Add** the new fractions. $\frac{3}{18}+\frac{4}{18}=\frac{7}{18}$
4) **Simplify** if necessary.

Complete the chart below.

	Expression	Sum or Difference (in simplest form)
Example	$\frac{1}{5}+\frac{2}{5}$	$\frac{3}{5}$
1	$\frac{1}{3}+\frac{2}{3}$	
2	$\frac{1}{2}+\frac{1}{7}$	
3	$\frac{1}{3}+\frac{1}{5}$	
4	$\frac{1}{5}-\frac{1}{6}$	
5	$\frac{2}{7}+\frac{1}{21}$	
6	$7-\frac{1}{2}$	
7	$4+\frac{1}{5}$	
8	$7-\frac{2}{6}$	
9	$\frac{6}{15}+\frac{2}{5}$	
10	$3\frac{1}{12}+2\frac{1}{9}$	

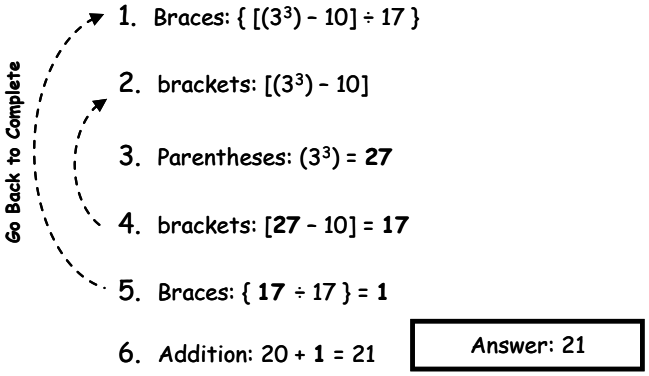
SCORE: / 10 (%)

MATH BUILD-UP #13
Grade 6: ORDER OF OPERATIONS

Order of Operations: A set of rules that describes the order in which to compute the four operations to determine the value of an expression.

Anchors℠:		
	***B**oy*	*Braces*
	***b**oy*	*brackets*
	***P**lease*	*Parentheses*
	***E**xcuse*	*Exponents*
	***M**y* ***D**ear*	*Multiplication / Division (left to right as they appear)*
	***A**unt* ***S**ally*	*Addition / Subtraction (left to right as they appear)*

Example: $20 + \{ [(3^3) - 10] \div 17 \}$



Answer: 21

Simplify the following expressions.

	Expression	Answer
1	$72 \div (4 + 8) \times 8$	
2	$72 \div (2^2 + 8) \times 4$	
3	$72 \div 2^3 \times 3^2$	
4	$72 + 2^3 \times 3^2$	
5	$(6 + 5) + (6 \times 5^2)$	
6	$[\ 72 \div\ (2^2 + 5)\ ] \times 2^2$	
7	$2 \times \{ [\ 7 + (3^3 + 3^2) + 3\ ] \times 3^2 \}$	
8	$\{ [\ (3^3 + 4^2) + 3 \times 4^3\ ] + 3 \} - 5$	
9	$4 + \{ [\ 3^3 + (3^2 + 2) \times 3^3\ ] \div 9 \}$	
10	$3^3 + (5 \times 2) \times 2^2$	

SCORE: /10 (%)

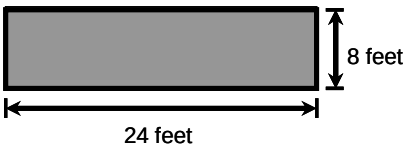
MATH BUILD-UP # 19
Grade 6: AREA

Area: The measure, in square units, of the inside region of a closed **two-dimensional figure.**

Area of a Rectangle = base × height or length × width.

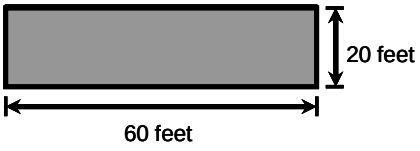
Calculate the area of the **shaded** regions below. Note: Figures **not** drawn to scale.

1)



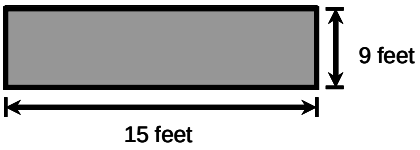
Answer: _____ square feet

2)



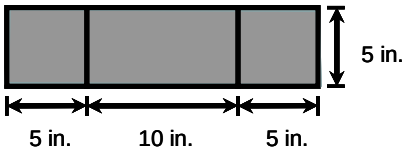
Answer: _____ square feet

3)



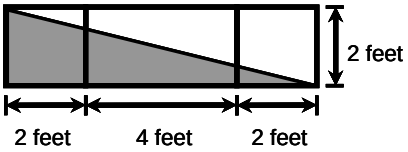
Answer: _____ **square yards**

4)



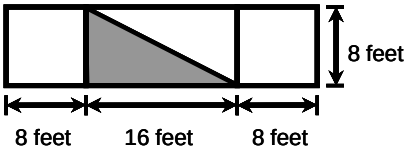
Answer: _____ square inches

5)



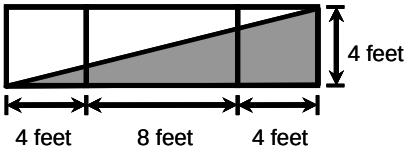
Answer: _____ square feet

6)



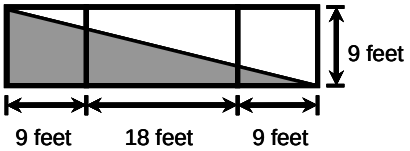
Answer: _____ square feet

7)



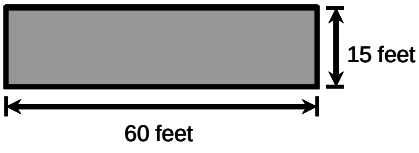
Answer: _____ square feet

8)



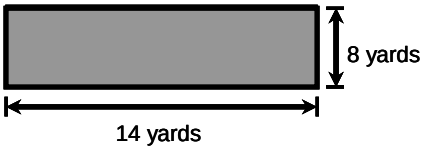
Answer: _____ square feet

9)



Answer: _____ **square yards**

10)



Answer: _____ **square feet**

SCORE: /10 (%)

B Measurement

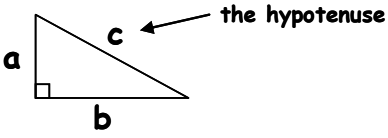
pREview

Concept: Pythagorean Theorem **Grade Cluster: 6-8**

Definition: Theorem that relates the three sides of a right triangle as $a^2 + b^2 = c^2$ where **c** is the hypotenuse.

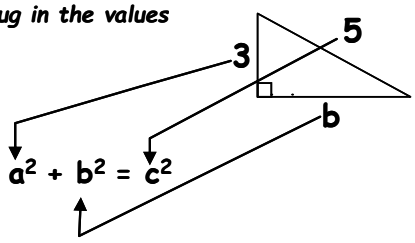
Hook(s)/Quik-Pt(s): 1. The hypotenuse of a triangle is the longest side.

$a^2 + b^2 = c^2$



2. If you know two sides of a right triangle, using the Pythagorean Theorem will allow you to get the third side. (Example: Find the length of **b** in the figure below; b= **4**)

Step 1: ***Plug in the values***



Step 2: ***Solve the equation***

$3^2 + b^2 = 5^2$

$b^2 = 5^2 - 3^2$

$b^2 = 25 - 9$

$b^2 = 16$

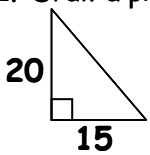
$\sqrt{b^2} = \sqrt{16}$

$b = 4$

Example: **A right triangle has a base of 15 and a height of 20. What is the length of the hypotenuse?**

Workspace:

1. Draw a picture



2. Plug in the values

$20^2 + 15^2 = c^2$

3. Solve the equation

$400 + 225 = c^2$

$625 = c^2$

$\sqrt{625} = \sqrt{c^2}$

$25 = c$

Answer: **25**

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