7th Grade Math

To Proficiency and Beyond!

MAFS.7.EE.1.1-FSA Practice

A CALCULATOR IS ALLOWED

1. Which expression is equivalent to $\frac{1}{4}(8 - 6x + 12)$?

Ⓐ $\frac{7}{2}x$

Ⓑ $-\frac{13}{2}x$

Ⓒ $-6x + 14$

Ⓓ $-\frac{3}{2}x + 5$

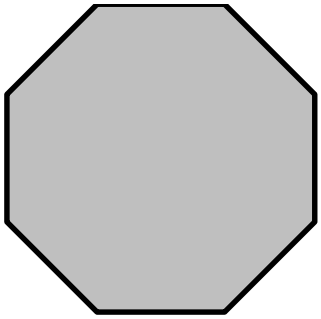
2. Mark all of the expressions in the table that are equivalent to: $-1.8\,x - 11.76\,y + 10.8$.
Explain or show work to justify your decisions.

	Expression	Equivalent
A.	$-1.8x - 11.76y + (10.8 + 3.06) - 3.06$	☐
B.	$-1.8(x + 11.76y - 10.8)$	☐
C.	$\frac{1}{2} \cdot (-1.8x - 11.76y + 10.8) \cdot 2$	☐
D.	$-1.8x - 11.76y + 0 \cdot 4.2z + 10.8$	☐
E.	$-(1.8x - 11.76y + 10.8)$	☐

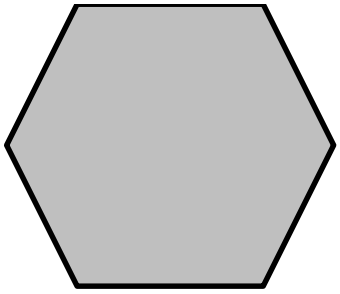
Explanation

3. A regular octagon has a side length of $\frac{3}{4}x - \frac{1}{4}$. A regular hexagon has a side length of $12 - x$.

$\frac{3}{4}x - \frac{1}{4}$.



$12 - x$



The difference between the *perimeters* of the two shapes is represented by the expression

$8\left(\frac{3}{4}x - \frac{1}{4}\right) - 6(12 - x)$.

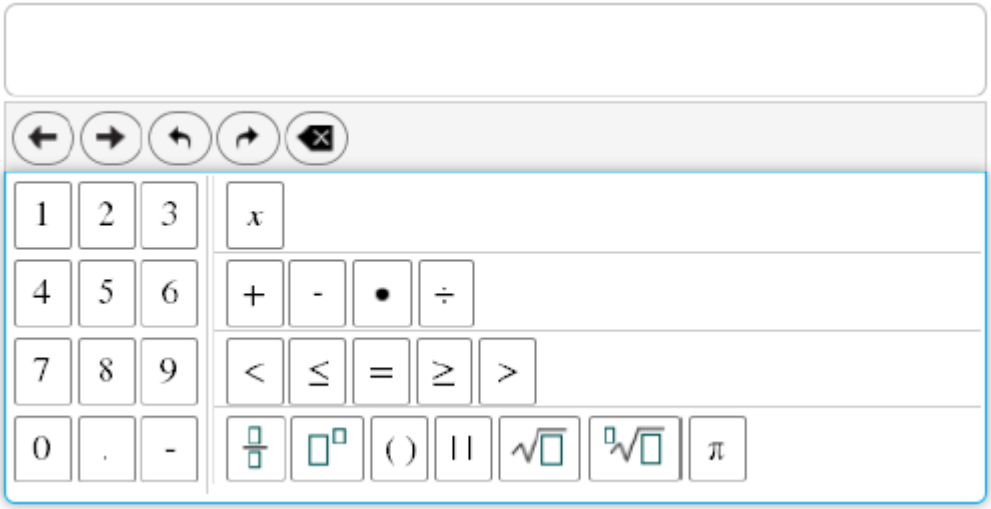
Write an expression equivalent to $8\left(\frac{3}{4}x - \frac{1}{4}\right) - 6(12 - x)$ using the fewest possible terms. Show all work neatly and clearly.

4. The students in Mr. Sanchez's class are converting distances measured in miles to kilometers. To estimate the number of kilometers, Abby takes the number of miles, doubles it, then subtracts 20% of the result to create the expression, $2m - 0.2(2m)$.

Renato first divides the number of miles by 5, then multiplies the result by 8 to create the expression, $8\left(\frac{m}{5}\right)$.

Determine if the two expressions are equivalent.

5.	What is the difference of the two expressions? $\left(\frac{3}{7}x+9\right)-\left(\frac{2}{7}x-3\right)$



MAFS.7.EE.1.2

Neutral-Questions for this standard may or may not allow the use of a calculator.

1. A garden is 15-feet long by 5-feet wide. The length and width of the garden will each be increased by the same number of feet. This expression represents the perimeter of the larger garden:

$$(x + 15) + (x + 5) + (x + 15) + (x + 5)$$

Which expression is equivalent to the expression for the perimeter of the larger garden?

Select **all** that apply.

Ⓐ $4x + 40$

Ⓑ $2(2x + 20)$

Ⓒ $2(x + 15)(x + 5)$

Ⓓ $4(x + 15)(x + 5)$

Ⓔ $2(x + 15) + 2(x + 5)$

2. Andrew sells treats from his ice cream cart. The items he sells along with their prices are shown in the table.

Item	Price	Quantity
Frosty Mango Pop	$1.75	*a*
Frozen Fruit Yogurt	$2.25	*b*
Sundae Swirl Cup	$2.75	*a*
Chocolate Chip Cone	$2.25	*c*
Fudge Sandwich	$1.75	*b*

Suppose Andrew sells the quantities of each item given by the variables in the table.

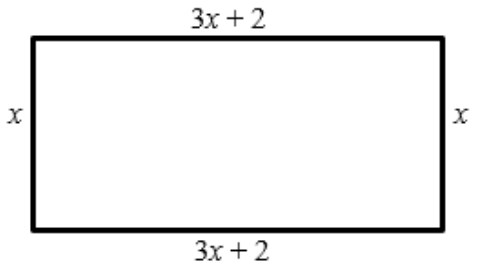
What does the expression $1.75a + 2.25b + 2.75a + 2.25c + 1.75b$ represent in the context of this problem?

3. An expression equivalent to the one above is $4.5a + 4b + 2.25c$.

What does the first expression show about the quantities in this problem that the second expression does not show?

Use the below diagram for problems 4, 5, & 6.

4. The width of the rectangle is *x* inches and the length is (3*x* + 2) inches.



Brit represented the perimeter of the rectangle using the expression:

x + (3*x* + 2) + *x* + (3*x* + 2).

Explain how Brit's expression represents the perimeter of the rectangle.
Write your answer in the space provided.

5.	Abbey represented the perimeter of the rectangle in problem with the expression $8x + 4$. Determine if Abbey's expression is equivalent to Brit's expression. Justify your reasoning. Write your answer in the space provided.
6.	Explain what the second expression, $8x + 4$, indicates about finding the perimeter of the rectangle. Write your answer in the space provided.

MAFS.7.EE.1.2-FSA Practice

Neutral-Questions for this standard may or may not allow the use of a calculator.

1. Which expression is not equivalent to the other three?

   A. $-8 - 7n + 16n$

   B. $9(n - 8)$

   C. $n - 8 + 8n$

   D. $9n - 8$

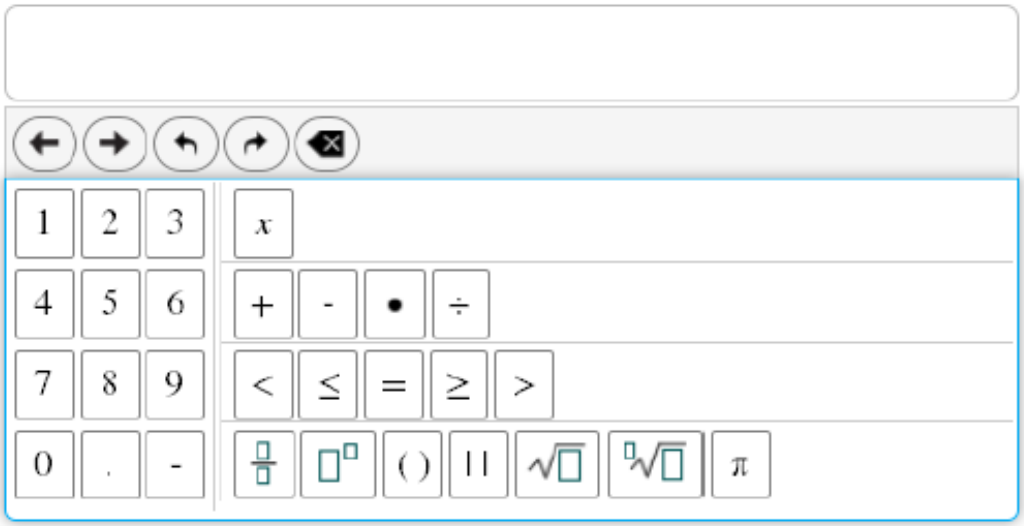
2. Why are the expressions $3(y - 2) + 2(y - 2)$ and $5(y - 2)$ equivalent? Justify your answer.

   Write your answer in the space provided.

3. **Refer to the below information for problems 3, 4, & 5.**

   Malia is at an amusement park. She bought 14 tickets, and each ride requires 2 tickets.

   Write an expression that gives the number of tickets Malia has left in terms of x, the number of rides she has already gone on. Find at least one other expression that is equivalent to it.



4. $14 - 2x$ represents the number of tickets Malia has left after she has gone on x rides.

How can each of the following numbers and expressions be interpreted in terms of tickets and rides?

14

−2

2x

Write your answer in the space provided.

5. $2(7 - x)$ also represents the number of tickets Malia has left after she has gone on x rides.

How can each of the following numbers and expressions be interpreted in terms of tickets and rides?

7

(7−x)

2

Write your answer in the space provided.

6. Select all the expressions that are equivalent to each other.

- ☐ A. 2(1+2b+3a)
- ☐ B. 2(1+2a)+2(a+2b)
- ☐ C. 6a+2+4b
- ☐ D. 2(3a+1)+4b+1

MAFS.7.EE.2.3

A CALCULATOR IS ALLOWED

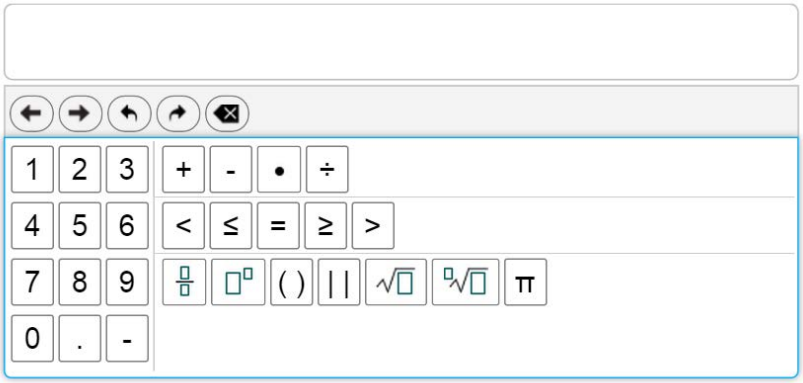
1. **Use the information provided to answer Part A and Part B.**

Each bulleted statement describes how the amount of income tax is determined for yearly taxable incomes in different ranges.

- Yearly taxable incomes of $8,925 or less are taxed at a flat rate of 10%.
- For yearly taxable incomes from $8,926 to $36,250, the first $8,925 is taxed at 10% and any income beyond $8,925 is taxed at 15%.
- For yearly taxable incomes greater than $36,250, the first $8,925 is taxed at 10%, the next $27,325 is taxed at 15%, and any income beyond $36,250 is taxed at 25%.

Part A

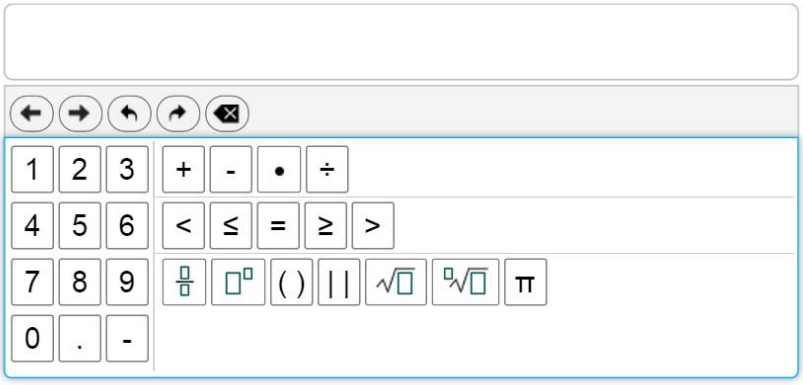
Mr. Vance's yearly taxable income is $35,675. What is the dollar amount taken out for taxes based on Mr. Vance's taxable income?



Part B

Mr. Rivera's taxable income is $20 each hour before taxes are taken out. Mr. Rivera worked a total of 40 hours each week for 50 weeks.

What is the dollar amount, to the nearest dollar, taken out for taxes based on Mr. Rivera's taxable income?



2. Use the information provided to answer Part A and Part B.

Today, Joelle walked 20 minutes at a rate of 3 miles per hour, and she ran 15 minutes at a rate of 6 miles per hour.

Part A

How many total miles did Joelle travel while walking and running?

Part B

Tomorrow, Joelle wants to travel a total of 4 miles by walking and running. She plans to run for 20 minutes at a rate of 6 miles per hour.

How many **minutes** should she walk at a rate of 3 miles per hour to finish traveling the 4 miles?

3. Use the information provided to answer Part A and Part B.

A teacher surveyed students in four classes to determine the location for a field trip. Each student chose only one location. The table shows the number of students from each class who chose each location.

Field Trip Choices

Class	Number of Students Who Chose the Zoo	Number of Students Who Chose the Museum	Number of Students Who Chose the Planetarium
Class E	10	9	8
Class F	8	11	11
Class G	12	8	5
Class H	6	10	8

Part A

Determine the percent of students in each class who chose the museum. What is the order, from **least** to **greatest**,of the percents for each class?

Ⓐ Class E, Class F, Class G, Class H

Ⓑ Class G, Class E, Class F, Class H

Ⓒ Class G, Class E, Class H, Class F

Ⓓ Class H, Class F, Class E, Class G

Part B

The total number of students who chose the zoo is how many times as great as the total number of students who chose the planetarium?

Ⓐ 1

Ⓑ $1\frac{1}{18}$

Ⓒ $1\frac{1}{8}$

Ⓓ $1\frac{1}{9}$

4.	At the beginning of the month, Alexa's bank account contained $4329.97. She then made two deposits of $452.28 each and a withdrawal of $279.34. Alexa estimates that she has about $5000 in her account. Use a mental strategy to determine if her estimate is reasonable. Explain and describe your strategy. Write your answer in the space provided.
5.	Bruno noticed today's gasoline price at the local convenience store was advertised as $3.40 per gallon. This price is 15% above last year's price. Calculate last year's price, showing each step of your work.

MAFS.7.EE.2.3-FSA Practice

A CALCULATOR IS ALLOWED

1.

Refer to the below information for problems 1 & 2.

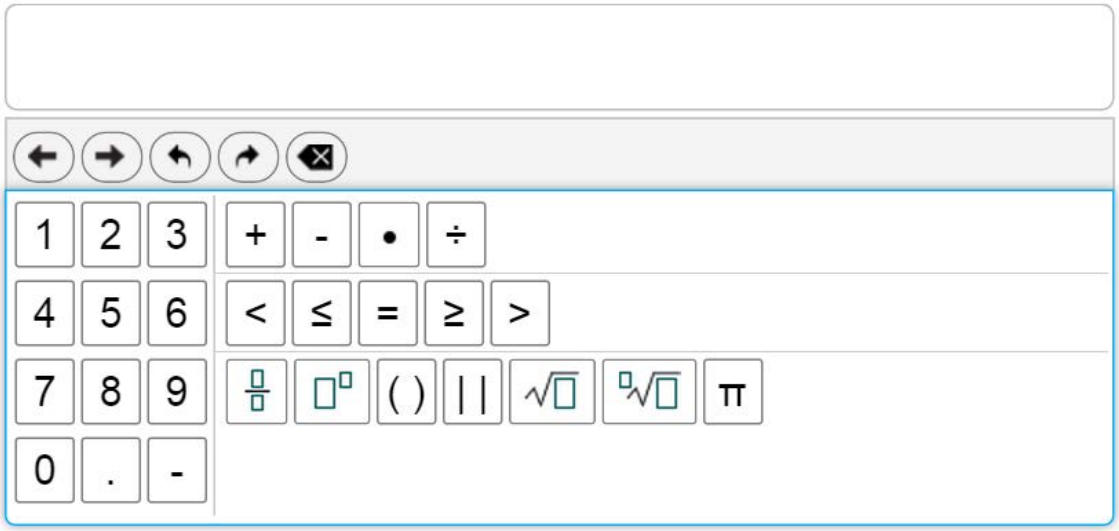
A Florida factory produces fishing reels at a rate of 800 per day, every day. In April, they are forced to cut their production by $\frac{1}{5}$ due to an aluminum shortage.

A chain of sporting goods stores orders 20,000 fishing reels.
Will the factory be able to produce enough fishing reels in the 30 days of April to meet this order? Explain how you know.

Write your answer in the space provided.

2.

How many days will it take the factory to produce the 20,000 fishing reels?



3.	Brittany's family went to dinner at her favorite restaurant because her father had a coupon for 15% off. Her father said if she could correctly figure out the total cost of dinner, including the $6\frac{1}{2}$% sales tax, he would take them all out for frozen yogurt on the way home. The meal cost $53.52 without the discount. Brittany determined the total, with the discount and sales tax, will be $44.50. Did Brittany figure it out correctly? Show your work to support your answer.
4.	Jordan earned $200 this month delivering newspapers. His mom said he must put 20% into his savings account. He wants to buy headphones that cost $99.95 and two shirts that cost $17.99 each. He also has to pay 7% sales tax on his purchases. Jordan said, “No problem. I will put 20% into savings, buy the things I want, and still have about $10 left.” Use estimation to determine if Jordan’s calculation is reasonable. Show your work.

5. A restaurant makes a special seasoning for all its grilled vegetables.

Here is how the ingredients are mixed:

$\frac{1}{2}$ of the mixture is salt

$\frac{1}{4}$ of the mixture is pepper

$\frac{1}{8}$ of the mixture is garlic powder

$\frac{1}{8}$ of the mixture is onion powder

When the ingredients are mixed in the same ratio as shown above, every batch of seasoning tastes the same.

Study the measurements for each batch in the table.
Fill in the blanks so that every batch will taste the same.

Ingredients	Batch 1	Batch 2	Batch 3
Salt (cups)	1	_____	_____
Pepper (cups)	_____	1	_____
Garlic powder (cups)	$\frac{1}{4}$	_____	1
Onion powder (cups)	_____	_____	1

MAFS.7.EE.2.4

A CALCULATOR IS ALLOWED

1. Two equations are shown.

- Equation 1: $-0.5x - 4 = 1.5$
- Equation 2: $-0.5(x - 4) = 1.5$

Select **each** statement that **must** be true.

Ⓐ x represents a negative value in both equations.

Ⓑ x represents a positive value in both equations.

Ⓒ x represents a positive value in one equation and a negative value in the other equation.

Ⓓ The value x represents in Equation 1 is less than the value x represents in Equation 2.

Ⓔ The value x represents in Equation 1 is greater than the value x represents in Equation 2.

2. **Use the information provided to answer Problems 2 and 3.**

Rebecca and Megan are shopping at a store that sells jewelry, scarves, and purses. The cost of all the items at the store include tax.

Rebecca buys some scarves that cost \$5 each and 2 purses that cost \$12 each. The cost of Rebecca's total purchase is \$39. What equation can be used to find n, the number of scarves that Rebecca buys?

Ⓐ $5 + 24n = 39$

Ⓑ $5n + 24 = 39$

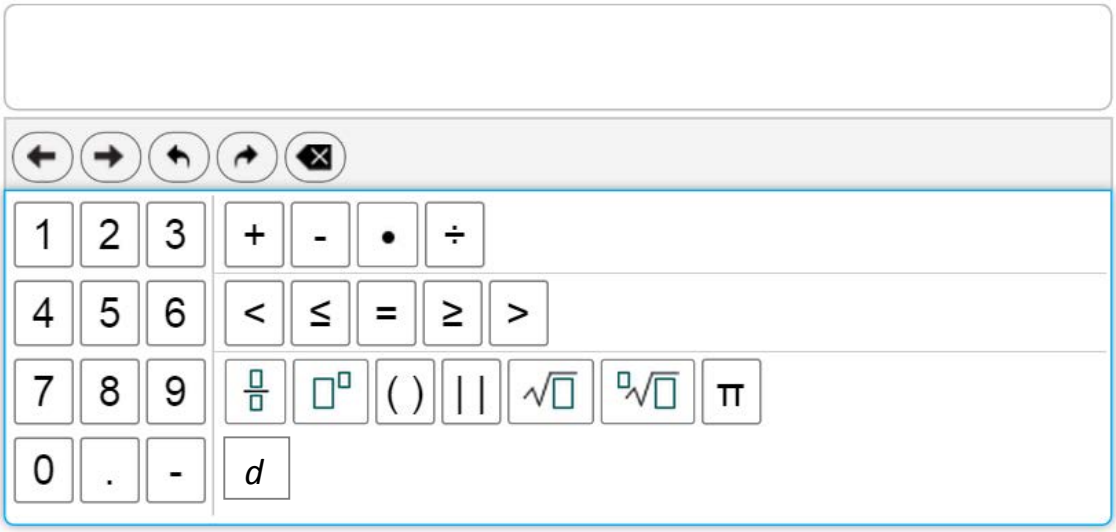
Ⓒ $(24 + 5)n = 39$

Ⓓ $24 \cdot 5 + n = 39$

3. Megan buys 3 bracelets and 3 necklaces. Each bracelet costs \$5. Megan pays the clerk \$40 and gets \$4 change. What is the cost, in dollars, of one necklace?

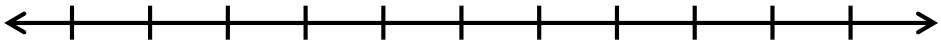
4. A scrapyard had 200 tons of recycled steel. They sold 15 tons per day for several days. If there are fewer than 80 tons left at the scrapyard, how many days, *d*, have passed?

A. Write an inequality to answer the question.



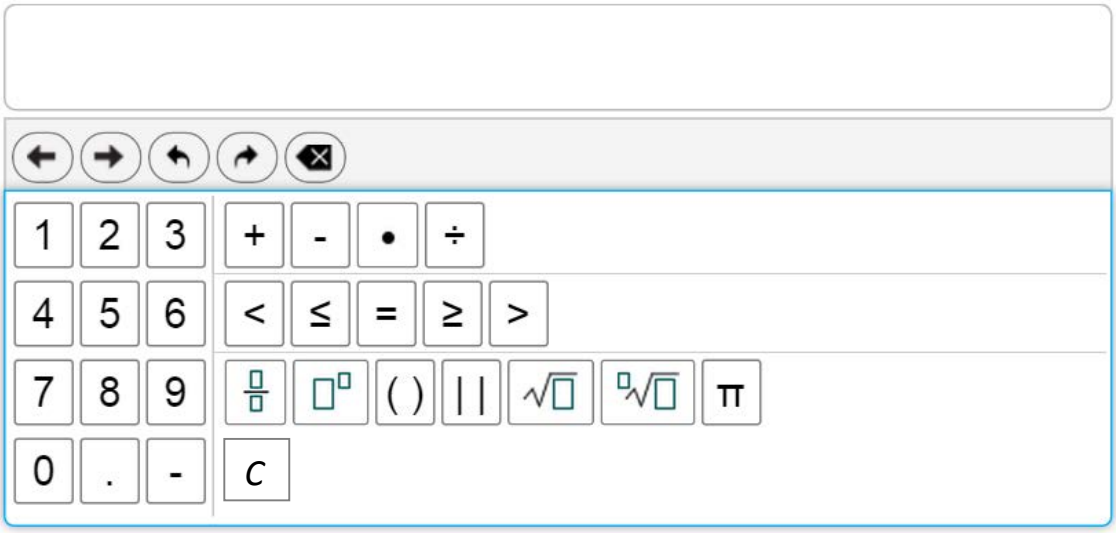
B. Solve the inequality.

C. Graph the solution set of the inequality. What does the solution of your inequality mean in terms of the answer to the question?



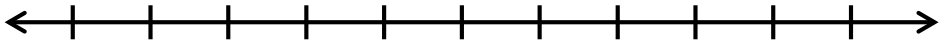
5. When carbon dioxide is frozen, it is called dry ice. In order to keep the carbon dioxide frozen, the temperature has to be $-109.3°$ Fahrenheit or lower. Fahrenheit is $\frac{9}{5}$ of the Celsius temperature plus 32 degrees.

A. Write an inequality to determine the Celsius temperatures, *C*, at which dry ice can be kept.



B. Solve your inequality.

C. Scale the number line below and graph the solution to the inequality.



MAFS.7.EE.2.4-FSA Practice

A CALCULATOR IS ALLOWED

1. Devon exercised the same amount of time each day for 5 days last week.

- His exercise included walking and swimming.
- Each day he exercised, he walked for 10 minutes.
- He exercised for a total of 225 minutes last week.

What is the number of minutes Devon swam **each** of the 5 days last week?

2. Jessica rented 1 video game and 3 movies for a total of $11.50.

- The video game cost $4.75 to rent.
- The movies cost the same amount each to rent.

What amount did Jessica pay to rent each movie?

3. A. Which of the equations below will answer the following question?

Check all that apply.

"I think of a number, add 8 and then multiply by 3. My answer is 66. What was my number?

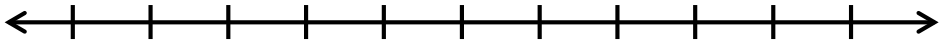
☐ A. $x + 24 = 66$

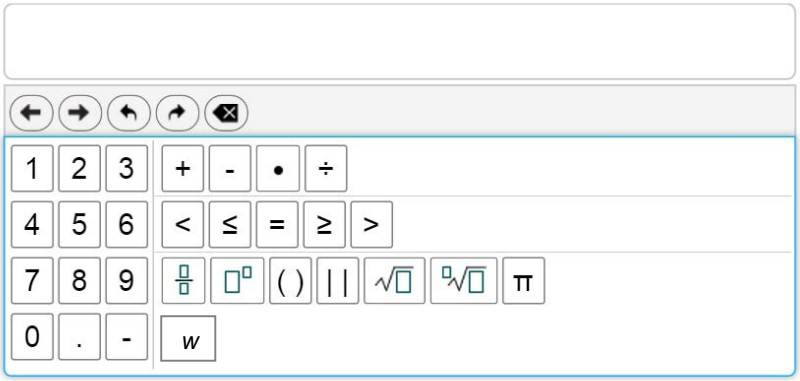
☐ B. $3x + 8 = 66$

☐ C. $3x + 24 = 66$

☐ D. $3(x + 8) = 66$

B. Find the value of x for the equation(s) for the number described.

4.	Aaron received a $25 gift card for his birthday. He used it to download a game for $3.99 and some songs for $0.99 each. The following inequality models the relationship among the quantities in this scenario where *x* represents the number of songs Aaron can afford to download: $25 \geq 0.99x + 3.99$ A. Show all work to solve the inequality. B. Scale the number line below and graph the solution to the inequality. Explain the meaning of your solution within the context of the problem. 
5.	Jonathan wants to save up enough money so that he can buy a new sports equipment set that includes a football, baseball, soccer ball, and basketball. This complete boxed set costs $50. Jonathan has $15 he saved from his birthday. In order to make more money, he plans to wash neighbors' windows. He plans to charge $3 for each window he washes, and any extra money he makes beyond $50 he can use to buy the additional accessories that go with the sports box set. A. Write inequality that represents the number of windows, *w*, Jonathan can wash in order to save at least the minimum amount he needs to buy the boxed set.

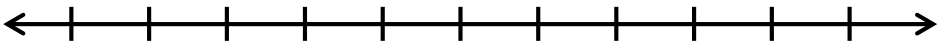


B. Solve the inequality.

C. What is a realistic number of windows for Jonathan to wash? How would that be reflected in the graph?

Write your answer in the space provided.

D. Scale the number line below and graph the solutions to the inequality.



MAFS.7.G.1.1

A CALCULATOR IS ALLOWED

Use the information provided to answer Questions 1 and 2.

The scale on a map shows that 5 centimeters = 2 kilometers.

1. What number of centimeters on the map represents an actual distance of 5 kilometers?

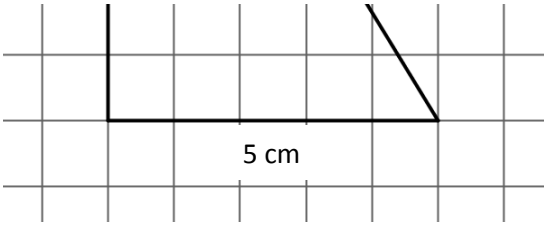
2. What is the actual number of kilometers that is represented by 2 centimeters on the map?

Many supersonic jet aircraft in the past have used triangular wings called delta wings. Below is a scale drawing of the top of a delta wing.

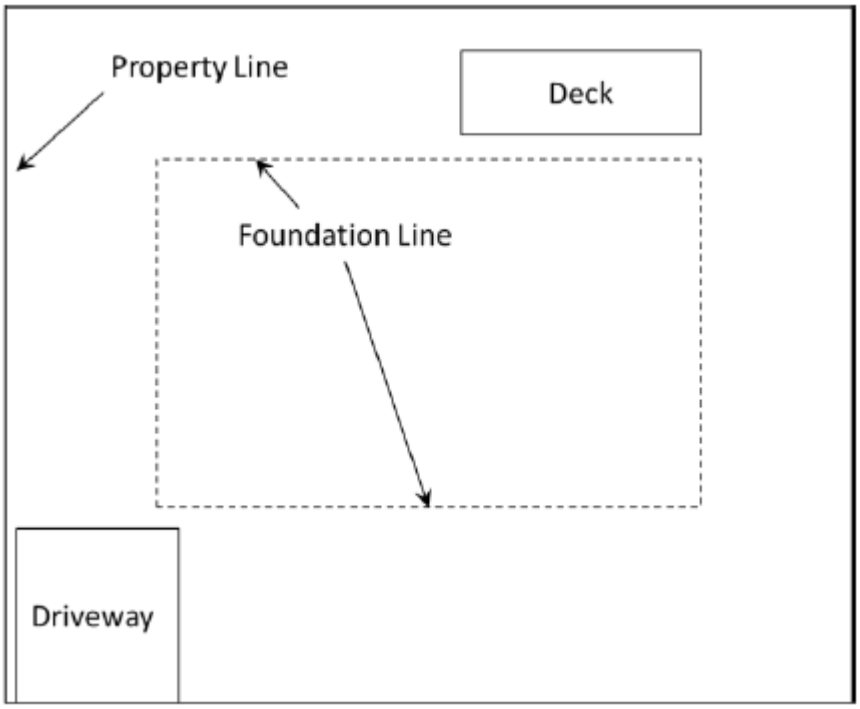
Scale: 2 centimeters (cm) in the drawing = 192 cm on the actual wing.

3. What is the length of the actual wing?

4. What is the area of the actual wing?



5. Over the break, your uncle and aunt ask you to help them cement the foundation of their newly purchased land and give you a top-view blueprint of the area and proposed layout. A small legend on the corner states that 4 inches of the length corresponds to an actual length of 52 feet.



A. What is the scale factor?

B. If the dimensions of the foundation on the blueprint are 11 inches by 13 inches. What are the actual dimensions in feet?

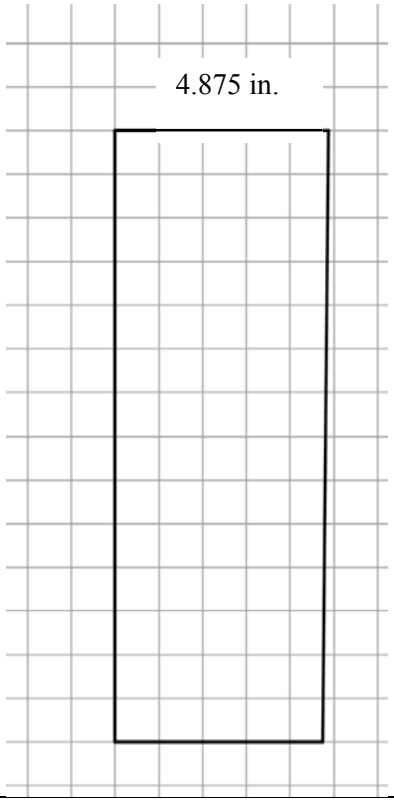
C. You're asked to go buy bags of dry cement and know that one bag covers 350 square feet. How many bags do you need to buy to finish this project?

MAFS.7.G.1.1-FSA Practice

A CALCULATOR IS ALLOWED

1. Racquel drew a picture of her school. She used the scale 1 cm : 3 m. Her drawing is 61 cm long. What is the length, in meters, of the actual school?

2. Each solar array wing on the International Space Station measures 39 feet by 112 feet. The scale drawing of a solar array wing shown below was made using a scale of 1 inch: 8 feet.



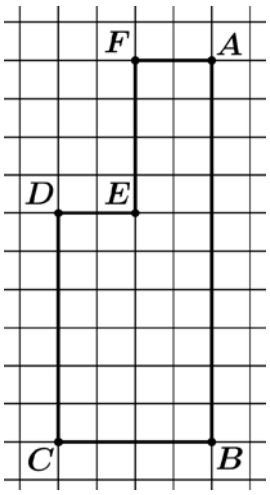
Write the ratio of the area of the wing in the drawing (square inches) to the area of an actual solar array wing (square feet) as a unit fraction.

3. Explain the relationship between your answer to Question 2 and the scale of the drawing.

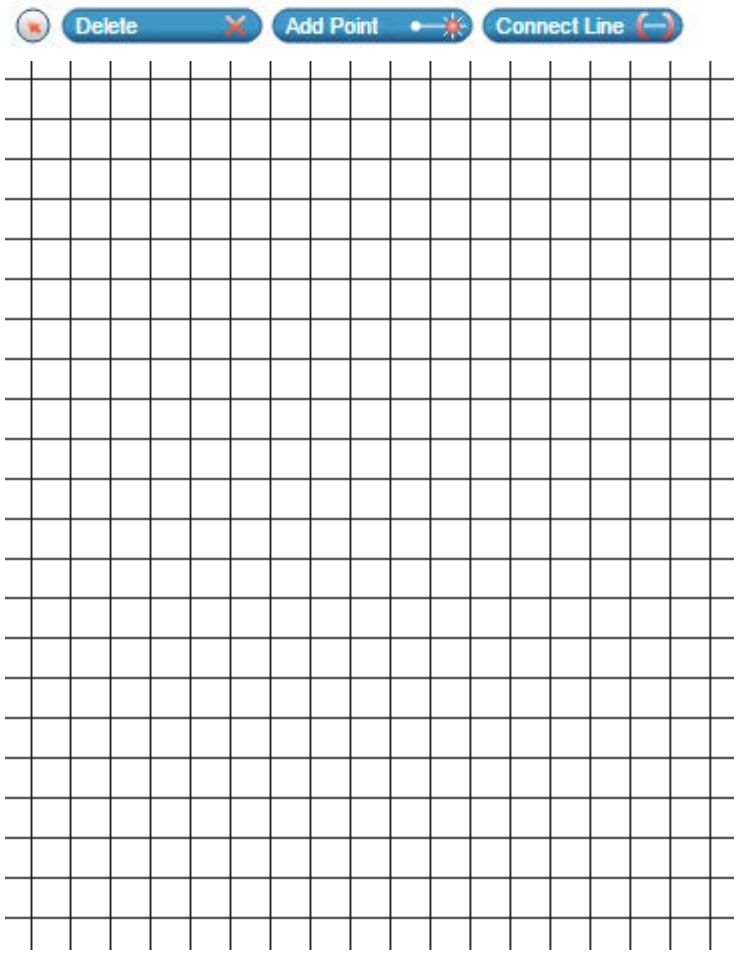
4. A landscape designer drew a blueprint of a garden she is designing for a client. The length of each square on her current grid is 1 centimeter (cm) and represents a length of 10 feet (ft) in the actual garden.

Maintaining the same actual garden dimensions, redraw the blueprint so that 1 cm represents a length of 5 ft in the actual garden.

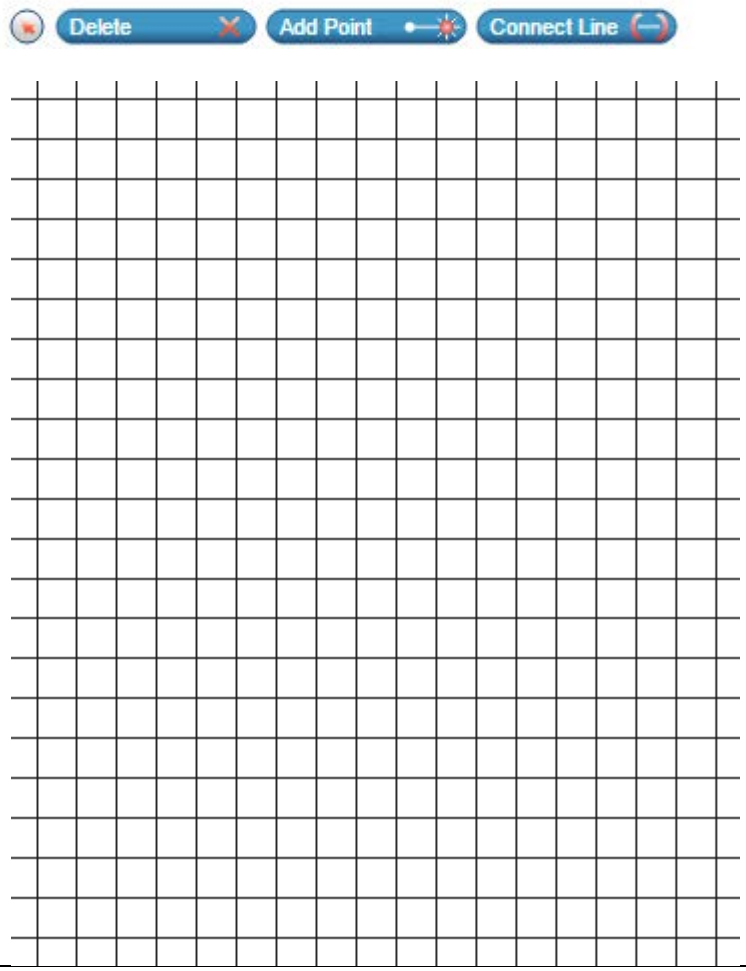
1 cm:10 ft

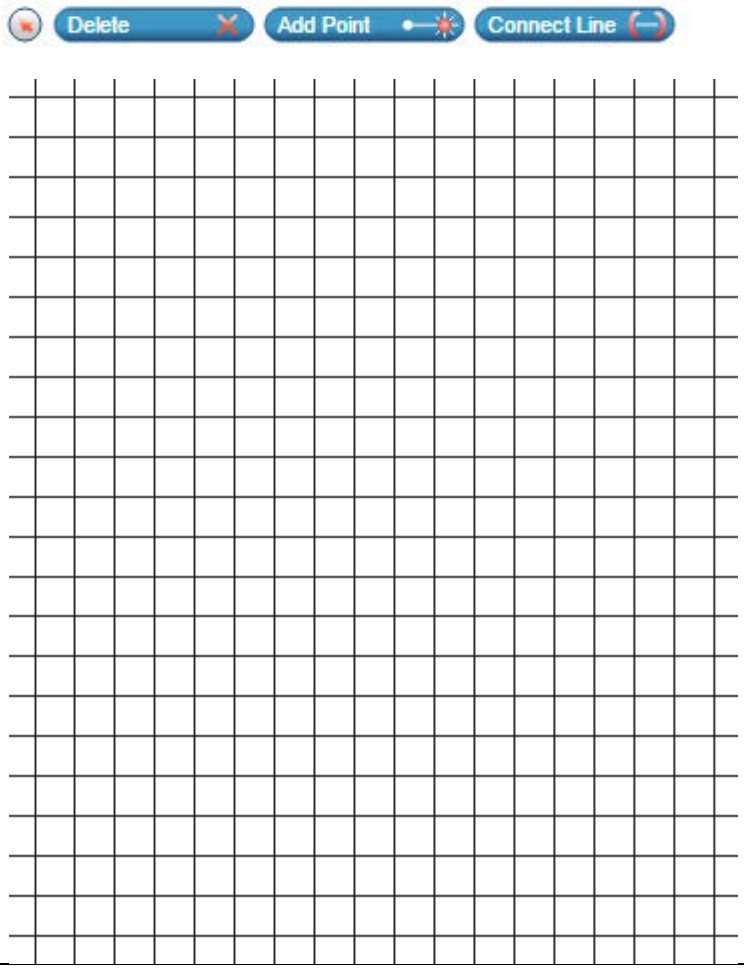


1 cm:5 ft



5. How did the new scale change the length of each side of the figure in the blueprint?

	MAFS.7.G.1.2	**Neutral-Questions for this standard may or may not allow the use of a calculator.**
1.	If possible, draw and label triangle *ABC* so that $\angle A$ measures 110°, $\angle B$ measures 30°, and $\angle C$ measures 40°.  	
2.	Is it possible to draw another triangle so that the angle measures are the same as in the triangle above but the lengths of the sides are different from those in the triangle above? Explain.	

3.	If possible, draw and label triangle *DEF* so that side $\overline{DE}$ is 1½ inches long, side $\overline{EF}$ is 2 inches long, and the measure of the included angle, ∠*E*, is 100°. 
4.	Is it possible to draw another triangle so that one side is 1½ inches long, another side is 2 inches long, and the measure of the included angle is 100° while the remaining side and angles have measures different from those of triangle *DEF*? Explain.

5. Determine if each set of lengths can be used to construct a triangle. If not, explain why not.

Side Lengths	Yes	No
A. 5 cm, 8 cm, 12 cm	☐	☐
B. 12 in., 12 in., 12 in.	☐	☐
C. 3 ft, 6 ft, 10 ft	☐	☐

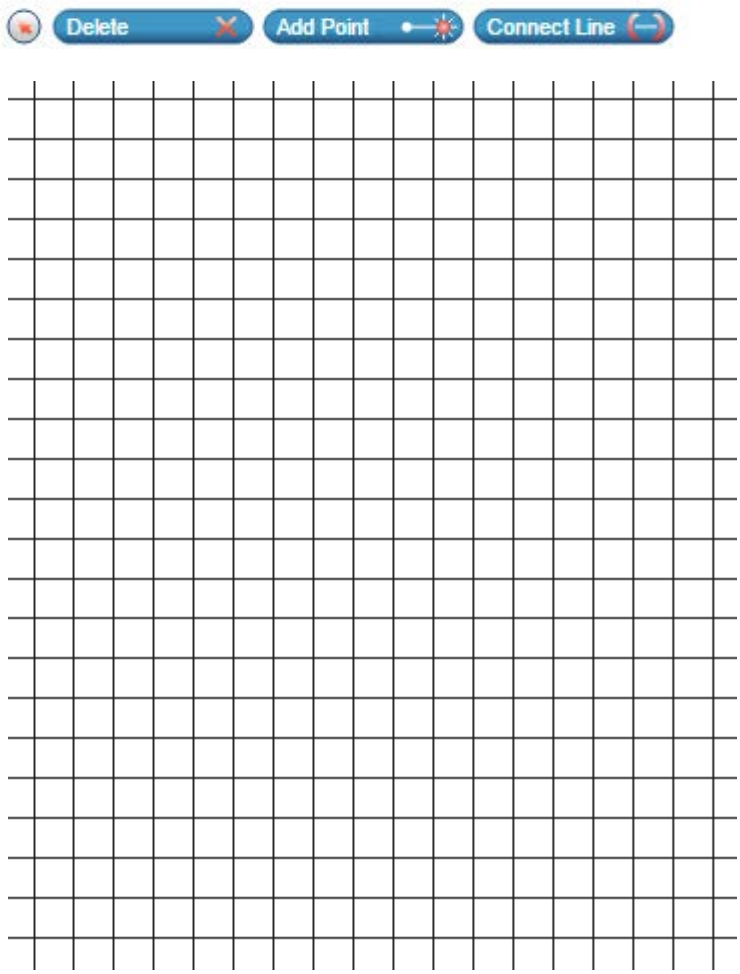
Explanation

In general, what must be true of three lengths in order for them to construct a triangle?

MAFS.7.G.1.2-FSA Practice

Neutral-Questions for this standard may or may not allow the use of a calculator.

1. If possible, draw and label triangle *ABC* so that side $\overline{AB}$ is 4 centimeters (cm) long, side $\overline{BC}$ is 7 cm long, and side $\overline{CA}$ is 9 cm long.

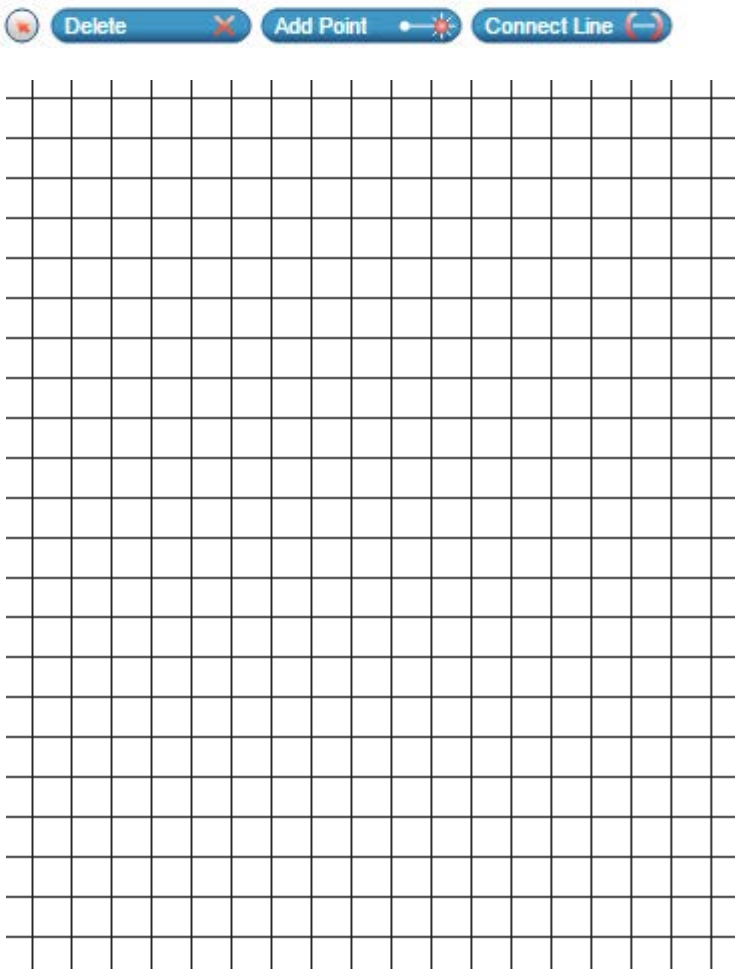


2. Is it possible to draw another triangle so that the sides are 4 cm, 7 cm, and 9 cm in length while the angles have different measures from those of triangle *ABC*?
Explain.

3. Discuss why it is, or is not possible to create a triangle with the given side lengths.

		Is it possible? Explanation:
A.	10,7,2 cm	
B.	3,4,5 cm	
C.	8,3,11 cm	

4. If you could change the length of the shortest side in part A, what is the maximum integer length it could be to form a triangle? Draw a picture or diagram to explain your reasoning.



Neutral-Questions for this standard may or may not allow the use of a calculator.

MAFS.7.G.1.3

1. Misha has a cube and a right square pyramid that are made of clay. She placed both clay figures on a flat surface.

Misha will make slices through each figure that are parallel and perpendicular to the flat surface. Which statements are true about the two-dimensional plane sections that **could** result from one of these slices? Select **all** that apply.

Ⓐ A plane section that is triangular could result from one of these slices through the cube.

Ⓑ A plane section that is square could result from one of these slices through the cube.

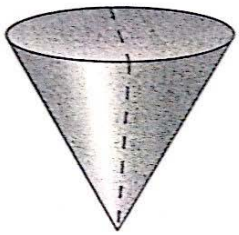
Ⓒ A plane section that is rectangular but not square could result from one of these slices through the cube.

Ⓓ A plane section that is triangular could result from one of these slices through the pyramid.

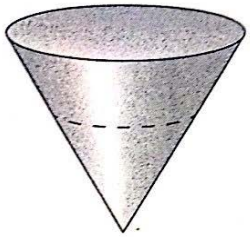
Ⓔ A plane section that is square could result from one of these slices through the pyramid.

Ⓕ A plane section that is rectangular but not square could result from one of these slices through the pyramid.

2. What two-dimensional shapes appear if you slice a cone as shown on each figure?



Vertical cut

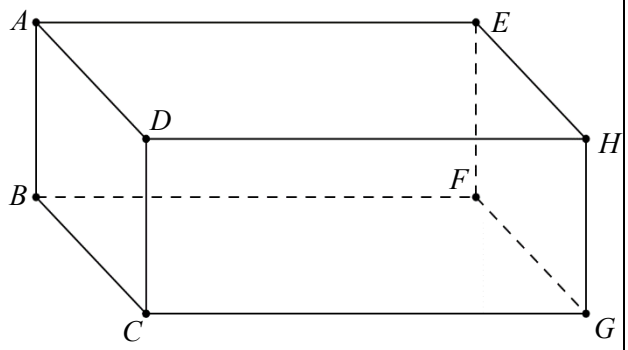


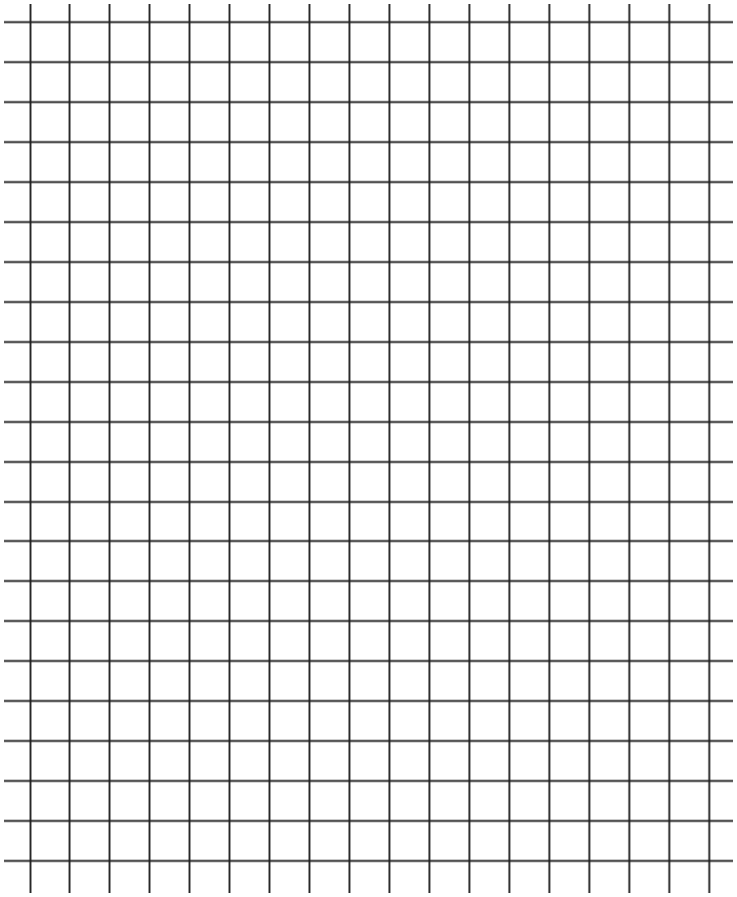
Horizontal cut

Write your answer in the space provided.

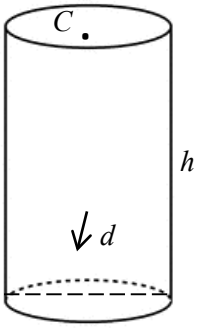
3. The figure shown to the right is a right rectangular prism.
Sketch the two-dimensional plane figure that results from making a horizontal slice, parallel to base *BCGF*. Describe how the dimensions of the cross-section compare to the dimensions of the prism.

$\overline{BC} = 6\ units, \overline{CG} = 10\ units, \overline{DC} = 4\ units$





4. Use the cylinder with height, *h=7 units*, center of base, *C*, and diameter, *d= 4 units*, to answer the following questions:



Describe the two-dimensional plane figure that results from making a horizontal slice, parallel to the base and how the dimensions of the cross-section compare to the dimensions of the cylinder.

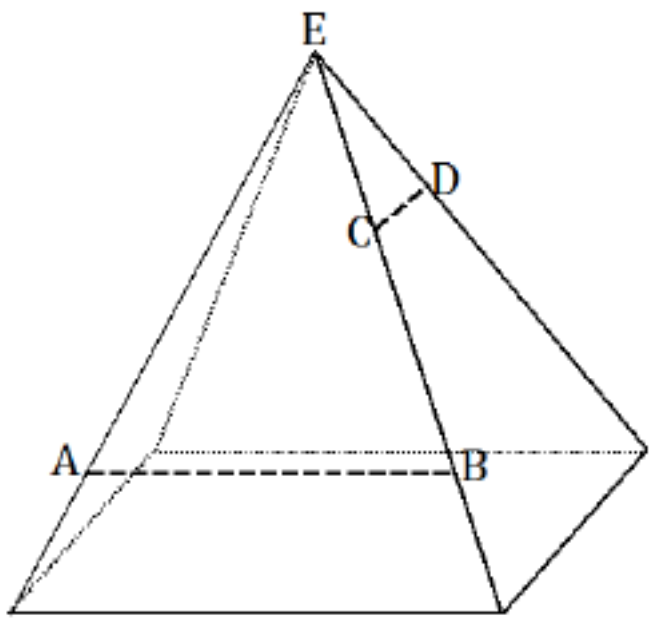
Write your answer in the space provided.

MAFS.7.G.1.3-FSA Practice

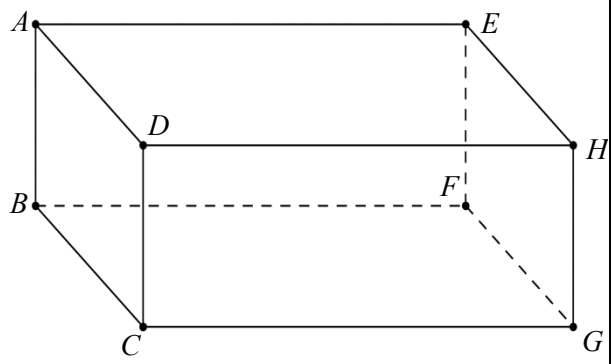
Neutral-Questions for this standard may or may not allow the use of a calculator.

1. Three vertical slices perpendicular to the base of the right rectangular pyramid are to be made at the marked locations: (1) through AB, (2) through CD, and (3) through vertex E .

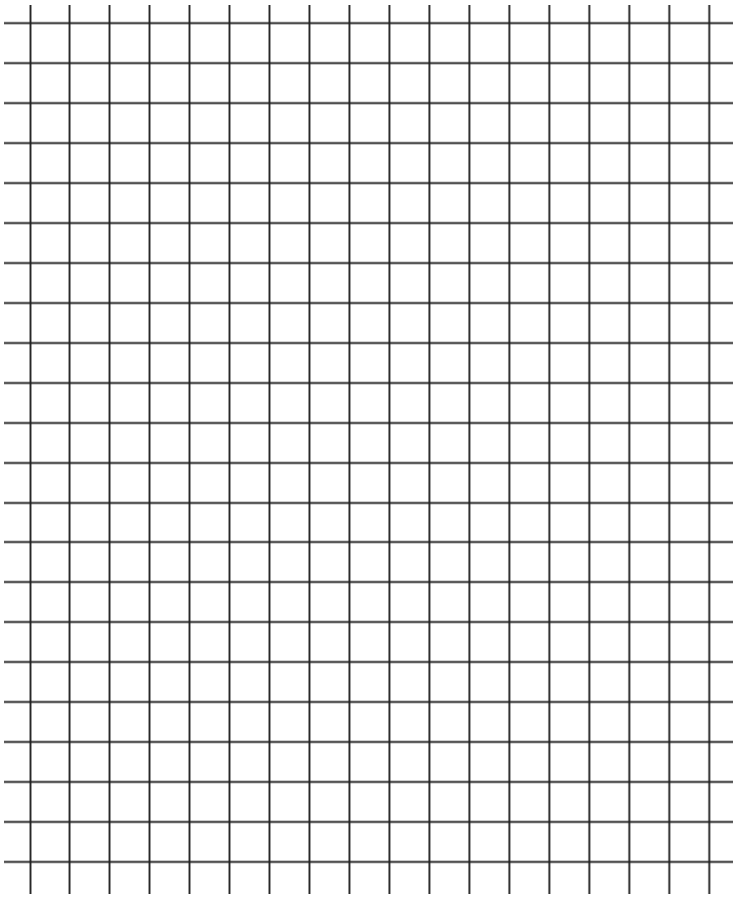
   Based on the relative locations of the slices on the pyramid, make a reasonable sketch of each slice. Include the appropriate notation to indicate measures of equal length.

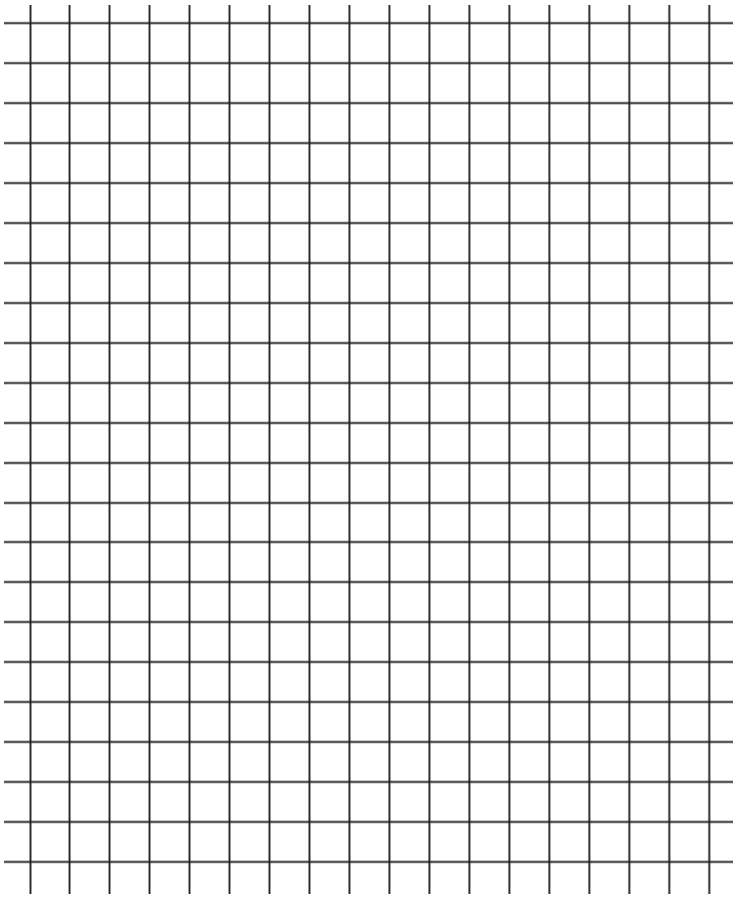


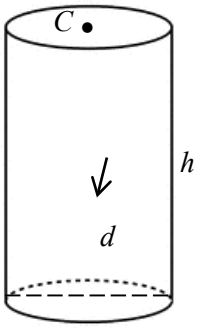
2. Sketch the two-dimensional plane figure that results from making a vertical slice, perpendicular to base *BCGF*. Describe how the dimensions of the cross-section compare to the dimensions of the prism.



$\overline{BC} = 6\ units, \overline{CG} = 10\ units, \overline{DC} = 4\ units$

	
3.	Use the cylinder with height, *h=7 units*, center of base, *C*, and diameter, *d= 4 units*, to answer the following questions: Sketch the two-dimensional plane figure that results from making a vertical slice, perpendicular to the base, through its center, *C*. Describe how the dimensions of the cross-section compare to the dimensions of the cylinder. 





4.	How would the two-dimensional plane figure that results from making a vertical slice, perpendicular to the base, not through the center of the base, compare to the vertical slice created in number 3?

	MAFS.7.G.2.4	 **A CALCULATOR IS ALLOWED**

1. Use the information provided to answer Part A and Part B.

A circular mirror has a diameter of 12 inches.

Part A

What is the area, in square inches, of the mirror?

Ⓐ 6π

Ⓑ 12π

Ⓒ 36π

Ⓓ 72π

Part B

A circular frame that is 3-inches wide surrounds the mirror.

What is the combined area, in square inches, of the circular mirror and the frame?

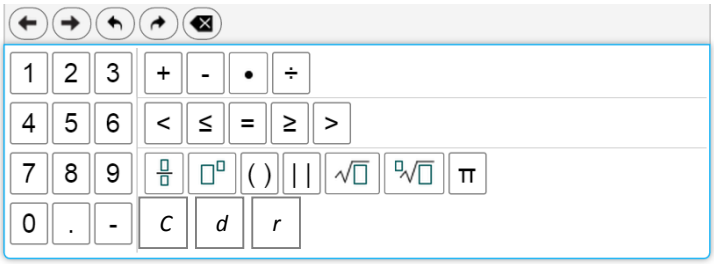
Ⓐ 9π

Ⓑ 18π

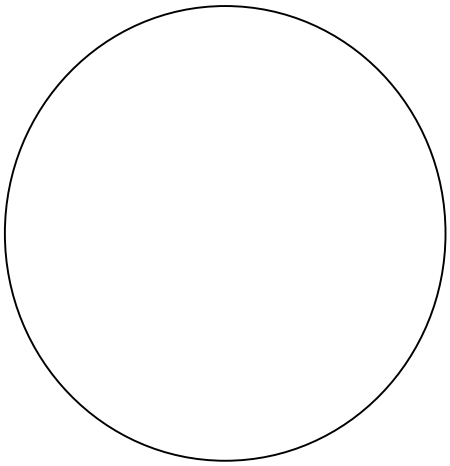
Ⓒ 54π

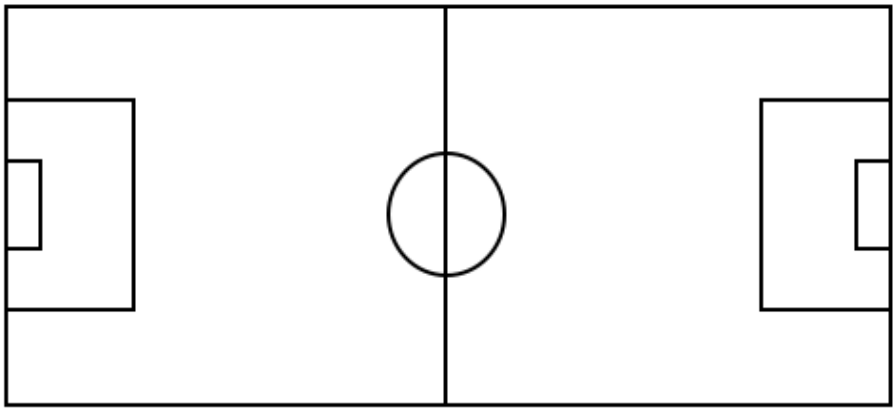
Ⓓ 81π

2. A. State the formula(s) for finding the circumference of a circle.
Write each answer on a separate line.



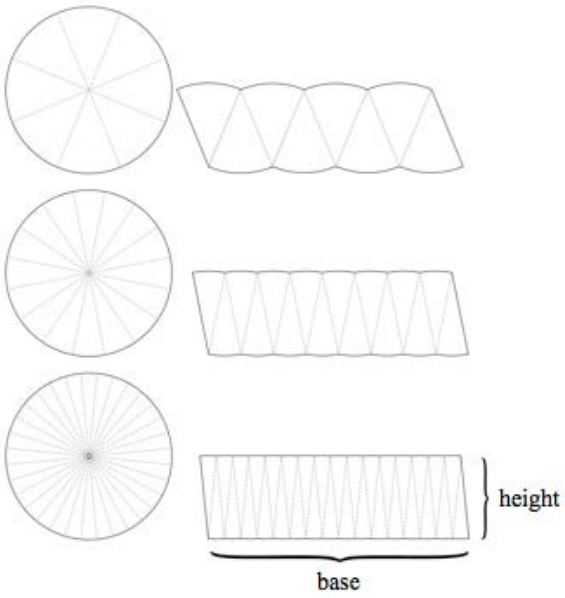
B. Explain what each symbol in the formula represents.

	C. On the diagram below, draw and label the dimensions represented by the variable(s) in the formula. 
3.	The London Eye is a giant Ferris wheel on the south bank of the river Thames in London, England. The height of the entire structure, including the support frame, is 135 meters. The wheel has a diameter of 120 meters. Find the circumference of the wheel. 

4.	The center circle of a soccer field prohibits a defender from being near the ball at the start or restart of a soccer game. On a professional soccer field this circle is 20 yards in diameter. Find the area of this circle. Show work or explain how you found your answer. 

5. The area of a circle can be divided into equal pieces called sectors that can be rearranged to make a new shape with the same area.

As the number of sectors increases, the sectors get smaller and smaller, and the new shape comes closer and closer to becoming a rectangle:



A. The height, h, of the rectangular shape is the same as the __?__ of the original circle.

h = _____

B. The base, b, of the rectangular shape is what fraction of the circumference, C, of the original circle?

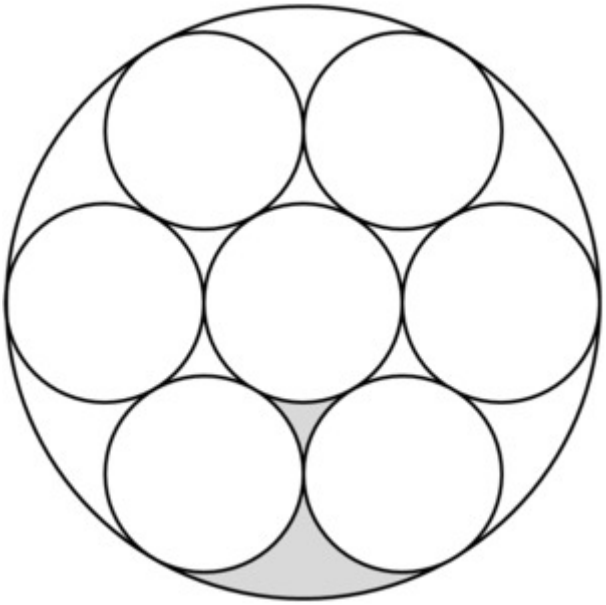
b = _____ $\times$ C

C. Write an equation for the area of the rectangular shape using your representations from Parts A and B.

MAFS.7.G.2.4-FSA Practice

A CALCULATOR IS ALLOWED

The figure below is composed of eight circles, seven small circles and one large circle containing them all. Neighboring circles only share one point, and two regions between the smaller circles have been shaded. Each small circle has a radius of 5 cm.



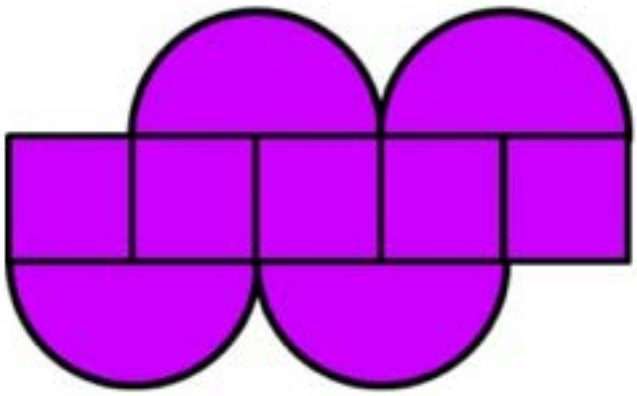
1. Calculate the area of the large circle.

2. Calculate the area of the shaded part of the figure.

3. The number π can be defined as the circumference of a circle with diameter 1 (unit). Using your knowledge about circles (that is, *without measuring*), complete the following table. Explain how you know the circumferences of the different circles.

Diameter of Circle (inches)	**Circumference of Circle (inches)**	**$\frac{\text{Circumference of Circle}}{\text{Diameter of Circle}}$**
1		
2		
3		
$\frac{1}{2}$		

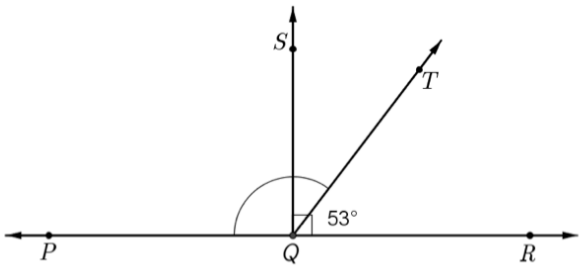
4. Find the area and the perimeter of the figure below. The figure is composed of small squares with a side-length of 1 unit and curves that are an arc of a circle.



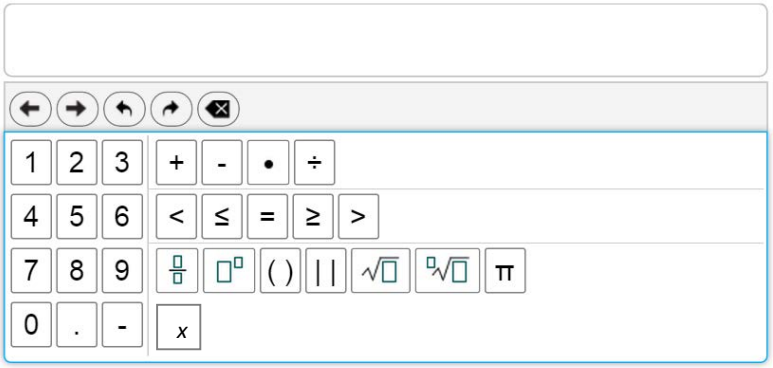
MAFS.7.G.2.5

A CALCULATOR IS ALLOWED

1.



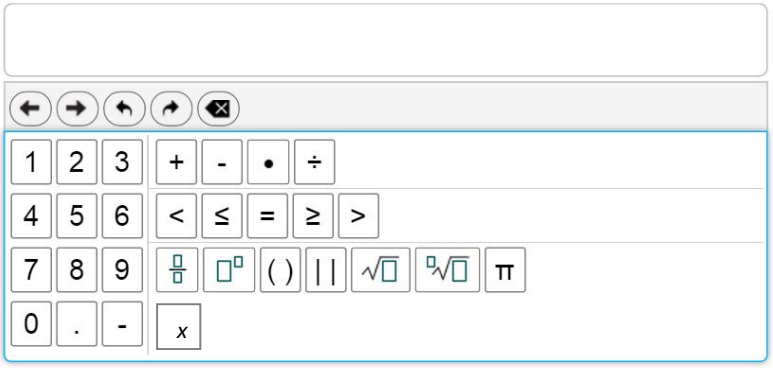
A. Write and solve an equation to find $m\angle PQT$, where $x = m\angle PQT$.



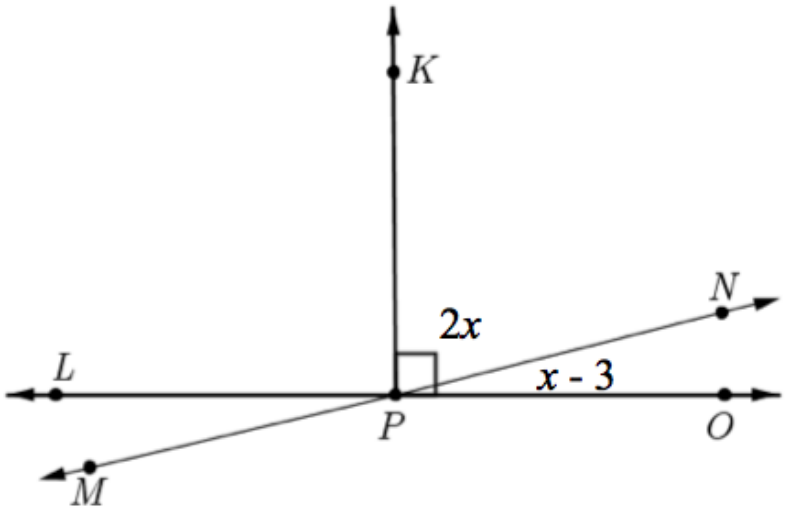
B. Solve your equation.

2.

A. Write an equation to find the $m\angle SQT$, where $x = m\angle SQT$.



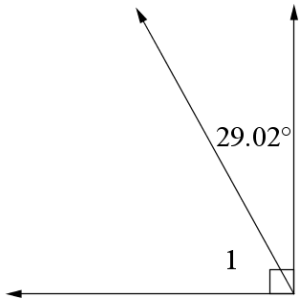
B. Solve your equation.

3.	 Write and solve an equation to find *x.* Show your work.
4.	What is *m∡KPN?* Show your work.
5.	What is *m∡MPL* ? Explain how you know. Write your answer in the space provided.

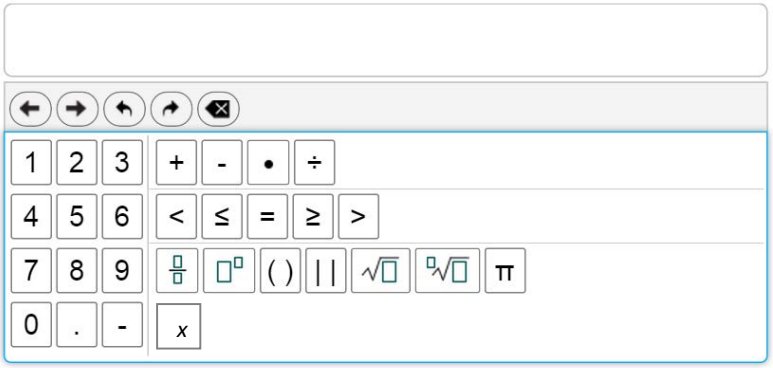
MAFS.7.G.2.5-FSA Practice

A CALCULATOR IS ALLOWED

1.

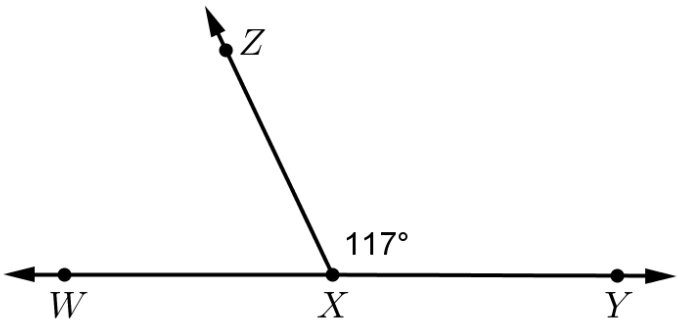


A. Write and solve an equation to find $m\angle 1$, where $x = m\angle 1$.

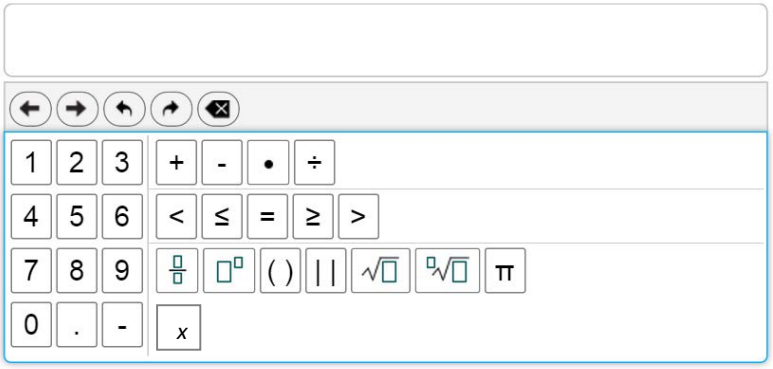


B. Solve your equation.

2. Points *W, X,* and *Y* are collinear (that is, on the same line).
Write and solve an equation to find $m\angle WXZ$.

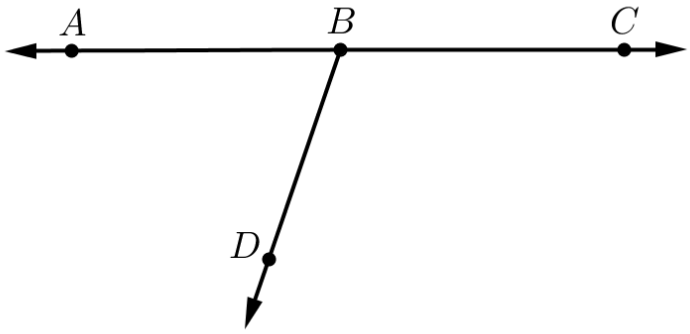


A. Write an equation to find the $m\angle WXZ$, where $x = m\angle WXZ$.



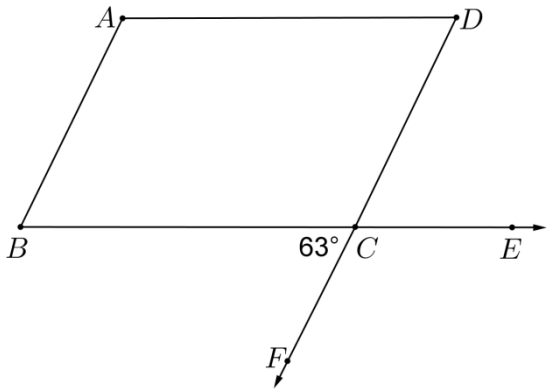
B. Solve your equation.

3. In the diagram below, $\angle ABC$ is a straight angle. The ratio of the measure of $\angle ABD$ to the measure of $\angle CBD$ is 2:3. Write and solve an equation to find $m\angle ABD$.



4.

Use the diagram to answer the questions.



A. What is the measure of ∠*DCE*? Write and solve an equation or explain how you know.

B. Write and solve an equation to determine the measure of ∠*FCE*.

5.

Which angle has the same measure as ∠*FCE*? Explain how you know.

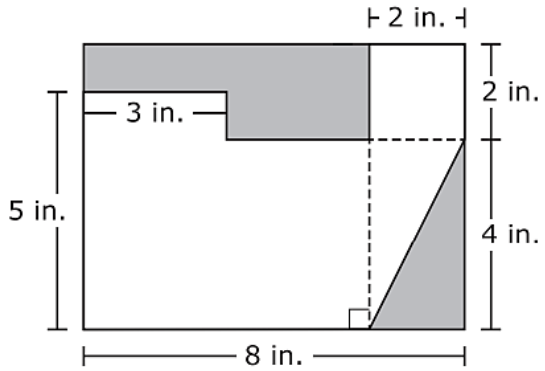
Write your answer in the space provided.

MAFS.7.G.2.6

A CALCULATOR IS ALLOWED

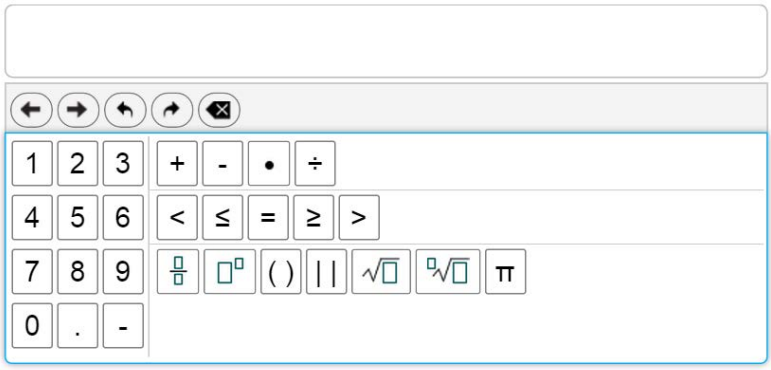
Use the information provided to answer Questions 1 and 2.

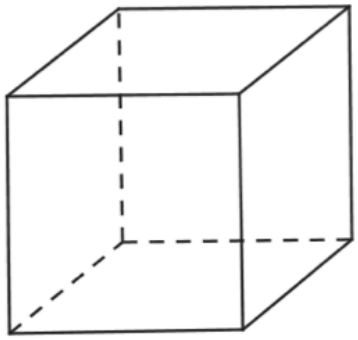
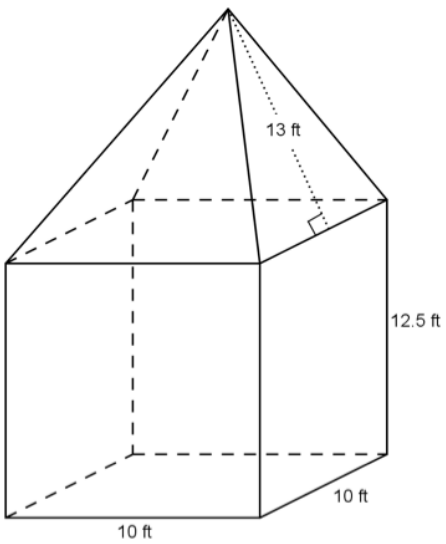
This figure shows two shaded regions and a non-shaded region. Angles in the figure that appear to be right angles are right angles.



1. What is the area, in square inches, of the triangular-shaped region that is shaded in this figure?

2. What is the area, in square inches, of the non-shaded region in this figure?



3.	The length of the edge of a cube is 8.2 cm. Label an edge length on the diagram and then find both the surface area and volume of the cube showing all work neatly and completely. Round to the nearest hundredth if necessary. 
4.	The structure shown below will be built for a carnival. The exterior surfaces are going to be painted. What is the total area of the exterior surfaces that need to be painted? Show all work neatly and completely. 

MAFS.7.G.2.6-FSA Practice

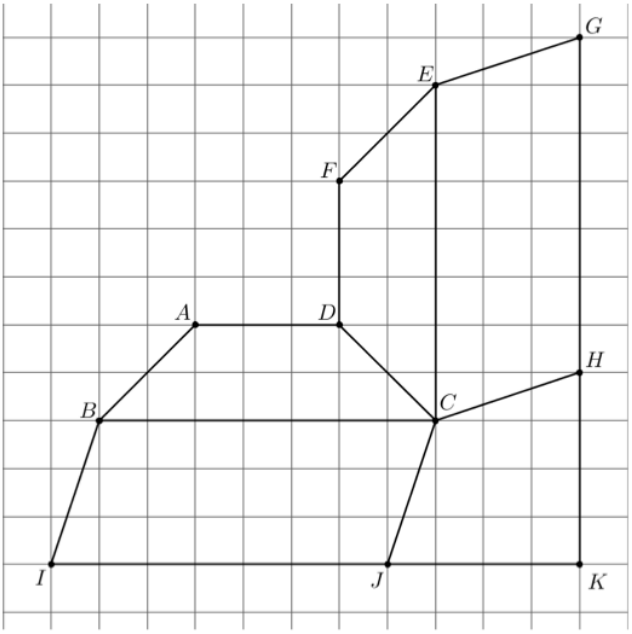
A CALCULATOR IS ALLOWED

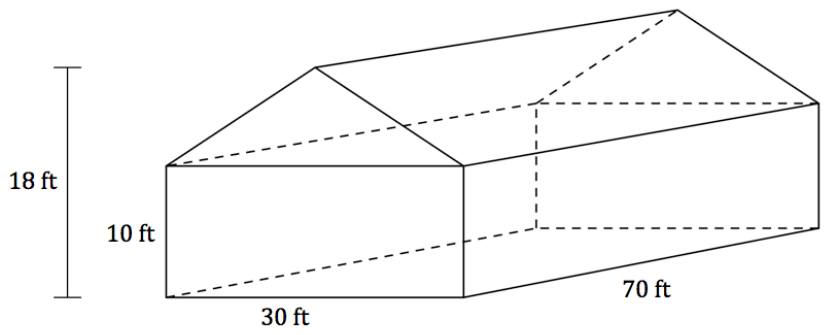
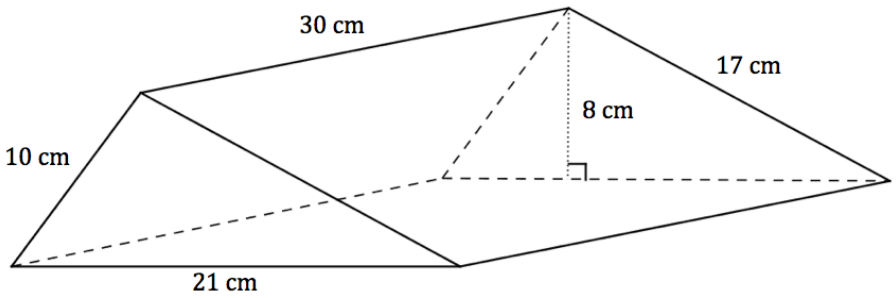
1. Tyler and Samantha are building the set for a school play. The design shown below was cut out of wood and now needs to be covered in fabric.

What is the total area of the wood that needs to be covered?

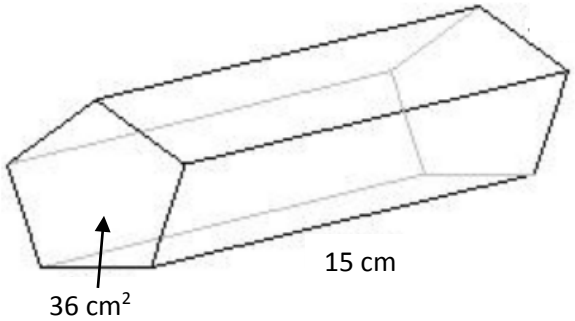
Each square in the grid has a length of one foot.

Show all work neatly and completely to justify your answer.

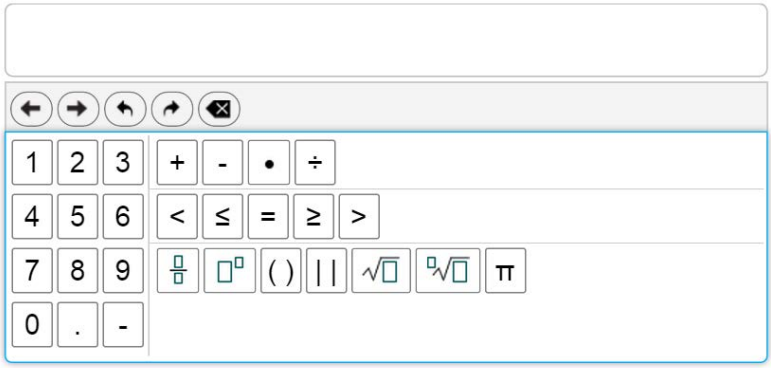


2.	Andrea needs a new air conditioning system for her house. An air conditioner needs to be big enough to cool a house, but it will wear out quickly if it is too big. Calculate the volume of the house pictured below to help Andrea choose the right air conditioner. 
3.	Find the surface area of the right triangular prism. Show all work and explain how you found your answer. 

4.



Find the volume of the pentagonal prism if the area of the base is 36 square centimeters and the height of the prism is 15 cm.



	MAFS.7.SP.1.1	**Neutral-Questions for this standard may or may not allow the use of a calculator.**
1.	Josephine owns a diner that is open every day for breakfast, lunch, and dinner. She offers a regular menu and a menu with daily specials. She wanted to estimate the percentage of her customers who order specials. She selected a random sample of 50 customers who had lunch at her diner during a three-month period. She determined that 28% of these customers ordered from the menu with specials. Which statement about Josephine's sample is true? Ⓐ The sample is the percentage of customers who order daily specials. Ⓑ The sample might not be representative of the population because it only included lunch customers. Ⓒ The sample shows that exactly 28% of Josephine's customers ordered daily specials. Ⓓ No generalizations can be made from this sample, because the sample size of 50 is too small.	
2.	A researcher wants to determine the mean height of 12-year-old boys in the United States. What might he do to gain the information needed to estimate the average height with confidence? Write your answer in the space provided.	
3.	Jeremy was asked to determine the favorite sport of all seventh graders at his school. After asking every student who entered the gym at last night's basketball game what their favorite sport is, Jeremy concluded that the favorite sport of seventh graders at his school is basketball. Is Jeremy's conclusion valid? Why or why not? Write your answer in the space provided.	

4. Benita and Jeff each surveyed some of the students in their eighth-grade homerooms to determine whether chicken or hamburgers should be served at the class picnic. The survey forms are shown below.

Benita's Survey
Homeroom: 8-A
Number of Students in Homeroom: 23

Student Surveyed	Chicken	Hamburger
Adam	✓	
Carlene	✓	
Nancy	✓	
Hugh	✓	

Jeff's Survey
Homeroom: 8-B
Number of Students in Homeroom: 20

Student Surveyed	Chicken	Hamburger
Becky		✓
Tanya	✓	
Joe	✓	
Ben		✓
Abby		✓
Linc	✓	
Marian		✓
Han		✓
Chris		✓
Tina		✓
Nate		✓
Darrell		✓

Benita reported that 100 percent of those in her survey wanted chicken. Jeff reported that 75 percent of those in his survey wanted hamburger.

Which survey, Benita's or Jeff's, would probably be better to use when making the decision about what to serve?

5. Explain why the survey you selected for Question 4 would be a better representation of their homeroom.

	MAFS.7.SP.1.1-FSA Practice	**Neutral-Questions for this standard may or may not allow the use of a calculator.**
1.	Palm Middle School is thinking about changing the flavor of ice cream sold in the cafeteria during lunch. The seventh grade student council members were asked to determine which flavor is the most popular. Of these four sampling methods, which will be most representative of the entire student population? A) Ask only the students who currently buy ice cream during lunch. B) Ask only the seventh grade students. C) Ask every third student who walks into the school. D) Ask every student council member.	
2.	Explain why each method in Question 2 would or would not be a good choice. Write your answer in the space provided.	
3.	In a poll of Mr. Briggs's math class, 67% of the students say that math is their favorite academic subject. The editor of the school paper is in the class, and he wants to write an article for the paper saying that math is the most popular subject at the school. Explain why this is not a valid conclusion and suggest a way to gather better data to determine what subject is most popular. Write your answer in the space provided.	
4.	You and a friend decide to conduct a survey at your school to see whether students are in favor of a new dress code policy. Your friend stands at the school entrance and asks the opinions of the first 100 students who come to campus on Monday. You obtain a list of all students at the school and randomly select 60 to survey. Your friend finds 34% of his sample in favor of the new dress code policy, but you find only 16%. Which do you believe is more likely to be representative of the school population? Explain your choice.	

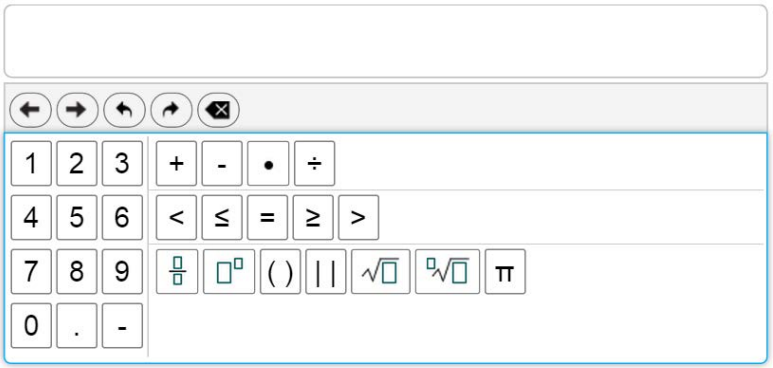
MAFS.7.SP.1.2

A CALCULATOR IS ALLOWED

1. A random sample of the 1,200 students at Moorsville Middle School was asked which type of movie they prefer. The results are compiled in the table below:

Action	Comedy	Historical	Horror	Mystery	Science Fiction
15	12	3	10	4	6

Use the data to estimate the total number of students at Moorsville Middle school who prefer horror movies.



2. Suppose another random sample of students were drawn for Question 1. Would you expect the results to be the same? Explain why or why not.

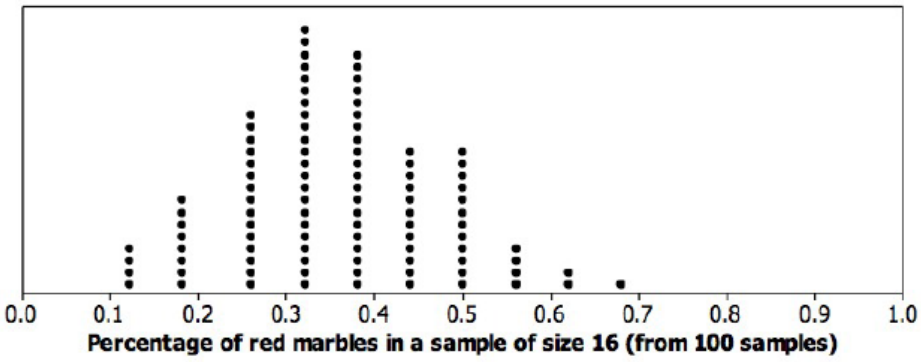
Write your answer in the space provided.

Use the following data for Questions 3, 4, and 5.

Any guest who makes an estimate that is within 9 percentage points of the true percentage of red marbles in the jar wins a prize, so any estimate from 24.6% to 42.6% will be considered a winner. To help with the estimating, a guest is allowed to take a random sample of 16 marbles from the jar in order to come up with an estimate. (Note: When this occurs, the marbles are then returned to the jar after counting.)

One of the hotel employees who does not know that the true percentage of red marbles in the jar is 33.6% is asked to record the results of the first 100 random samples. A table and dot plot of the results appears below.

Percentage of red marbles in the sample of size 16	Number of times the percentage was obtained
12.50%	4
18.75%	8
25.00%	15
31.25%	22
37.50%	20
43.75%	12
50.00%	12
56.25%	4
62.50%	2
68.75%	1
Total:	100



For example, 15 of the random samples had exactly 25.00% red marbles; only 2 of the random samples had exactly 62.50% red marbles, and so on.

3. A. Assume that each of the 100 guests who took a random sample used their random sample's red marble percentage to estimate the whole jar's red marble percentage. Based on the table above, how many of these guests would be "winners"?

B. How many of the 100 guests obtained a sample that was *more than* half red marbles?

4.	Should we be concerned that none of the samples had a red marble percentage of exactly 33.6% even though that value is the true red marble percentage for the whole jar? Explain briefly why a guest can't obtain a sample red marble percentage of 33.6% for a random sample size of 16.
5.	Recall that the hotel employee who made the table and dot plot above didn't know that the real percentage of red marbles in the entire jar was 33.6%. If another person thought that half of the marbles in the jar were red, explain briefly how the hotel employee could use the dot plot and table results to challenge this person's claim. Specifically, what aspects of the table and dot plot would encourage the employee to challenge the claim?

MAFS.7.SP.1.2-FSA Practice

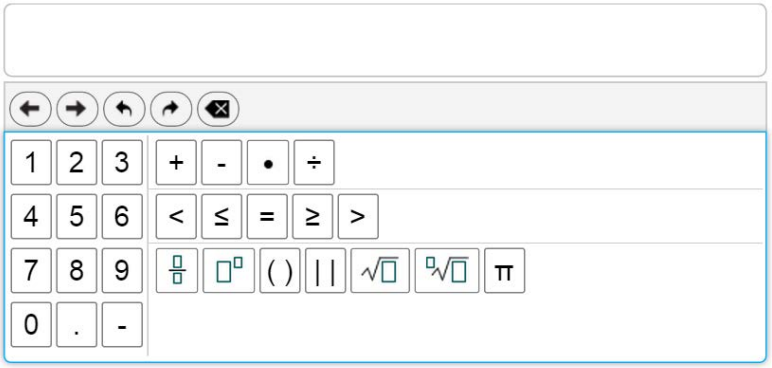
A CALCULATOR IS ALLOWED

1. Mr. Mann, principal at Franklin High School, wondered if the students at his school would prefer longer school days for four days a week or shorter school days for five days a week. The total number of hours spent in school would be the same in either scenario.

   Out of the 2,600 students enrolled in Franklin High School, Mr. Mann randomly interviewed 50 students from three different grade levels. The results are compiled in the chart below:

Groups	Longer days, 4 days a week	Shorter days, 5 days a week
10th grade	32	18
11th grade	26	24
12th grade	34	16

   Estimate the number of students out of the whole school who prefer longer days, four days a week.



2. What might be done to increase the confidence in the estimate for Question 1?

3. Amanda asked a random sample of 40 students from her school to identify their birth month. There are 300 students in her school. Amanda's data is shown in this table.

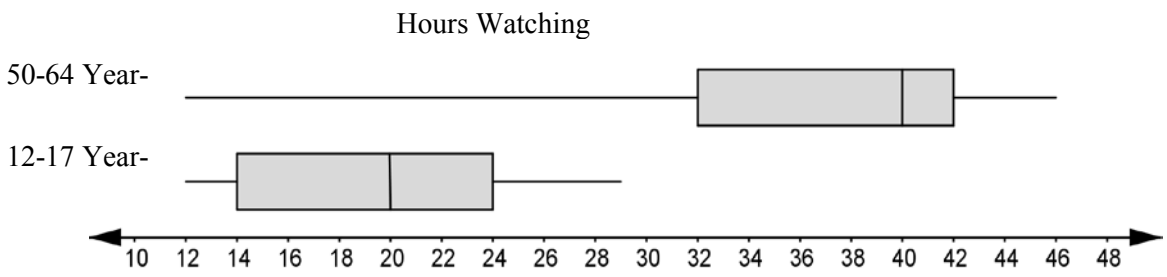
Student Birth Months

Birth Month	Number of Students
January	3
February	0
March	3
April	10
May	4
June	3
July	4
August	3
September	2
October	2
November	3
December	3

Which of these statements is **best** supported by the data?

I. Exactly 25% of the students in Amanda's school have April as their birth month.
II. There are no students in Amanda's school that have a February birth month.
III. There are probably more students at Amanda's school with an April birth month than a July birth month.
IV. There are probably more students at Amanda's school with a July birth month than a June birth month.

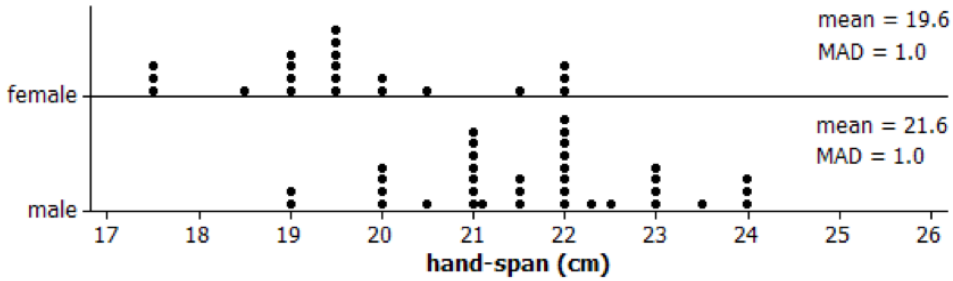
4. Explain why the statement you chose is **best** supported by the data.

	MAFS.7.SP.2.3	**Neutral-Questions for this standard may or may not allow the use of a calculator.**
1.	Data on the number of hours per week of television viewing was collected on a sample of Americans. The graphs below summarize this data for two age groups.  What is the median number of hours of television viewing per week for each age group? 12-17 age group median _____ 50-64 age group median_____	
2.	What is the interquartile range for each age group? 12-17 age group interquartile range_____ 50-64 age group interquartile range _____	
3.	Describe the difference between the medians as a multiple of the interquartile range.	

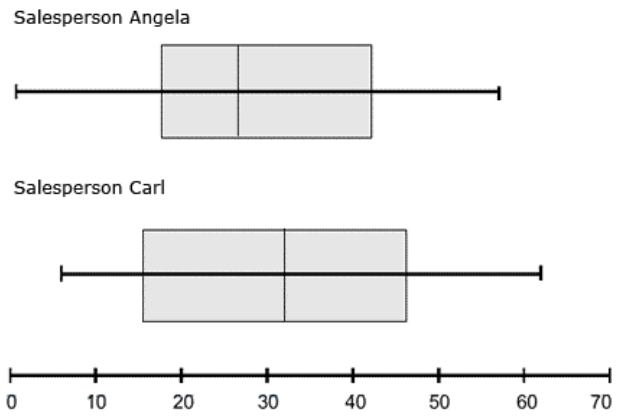
MAFS.7.SP.2.3-FSA Practice

Neutral-Questions for this standard may or may not allow the use of a calculator.

1. Students in a random sample of 57 students were asked to measure their hand-spans (distance from outside of thumb to outside of little finger when the hand is stretched out as far as possible). The graphs below show the results for the males and females.



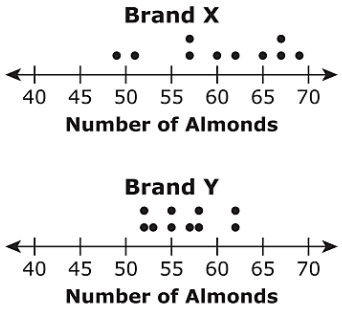
Based on these data, do you think there is a difference between the population mean hand-span for males and the population mean hand-span for females?
Justify your answer.

2.	**The box plots shown compare Angela's vacuum sales to Carl's vacuum sales over a one-month period. Use the box plots shown to answer Questions 2-5.**  Who would you say was a more successful salesperson and why?
3.	What is the *difference* in their median sales?
4.	How much higher was Carl's maximum than Angela's?
5.	Who had a bigger *range* (or variation) in their sales?

MAFS.7.SP.2.4

Neutral-Questions for this standard may or may not allow the use of a calculator.

1. Alexis chose a random sample of 10 jars of almonds from each of two different brands, X and Y. Each jar in the sample was the same size. She counted the number of almonds in each jar. Her results are shown in the plots.



Based on the plots, which statement **best** compares the number of almonds in the jars from the two brands?

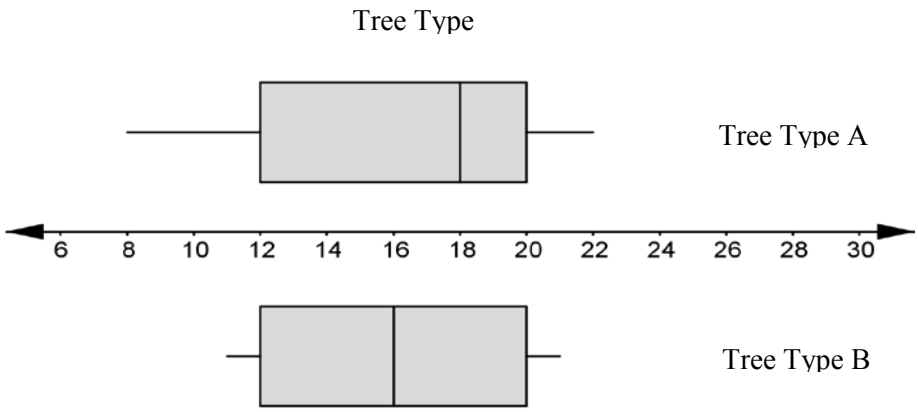
Ⓐ The number of almonds in jars from Brand X tends to be greater and more consistent than those from Brand Y.

Ⓑ The number of almonds in jars from Brand X tends to be greater and less consistent than those from Brand Y.

Ⓒ The number of almonds in jars from Brand X tends to be fewer and more consistent than those from Brand Y.

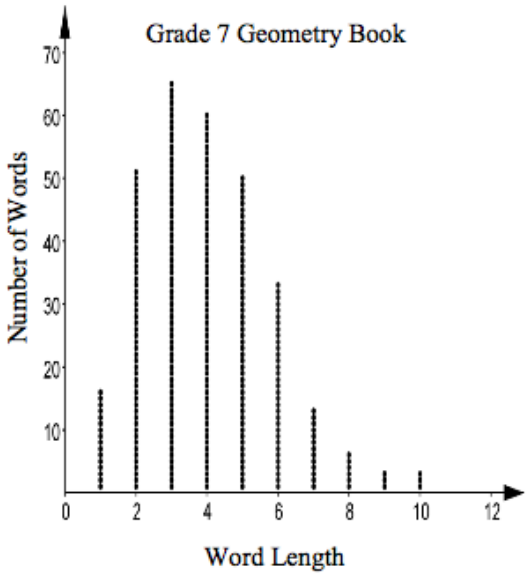
Ⓓ The number of almonds in jars from Brand X tends to be fewer and less consistent than those from Brand Y.

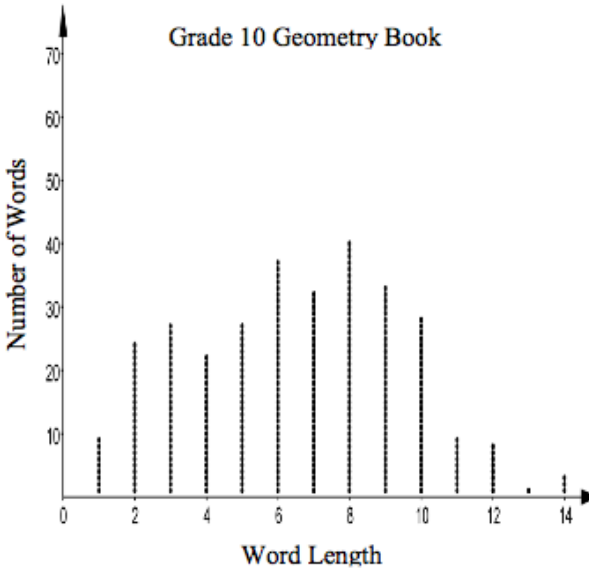
2. In a local park, Jeremy collected data on the heights of two types of trees by measuring the heights of randomly selected trees of these types: Tree Type A and Tree Type B. He displayed each distribution of sample heights in the following box plots:



Compare the two distributions. What inferences can you draw about the heights of the two types of trees?

3. Peter is comparing the lengths of words in a seventh grade geometry book to the lengths of words in a tenth grade geometry book for a statistics project. He plotted the length of 300 randomly selected words from each book and calculated the mean and the mean absolute deviation (MAD) for each set of data.





Grade 7	Mean = 4.0 MAD = 1.4

Grade 10	Mean = 6.5 MAD = 2.5

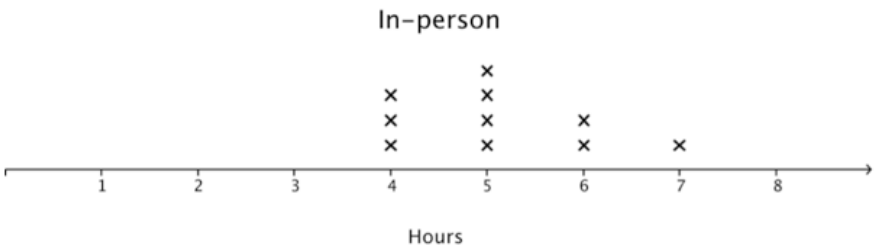
Use the mean and the MAD to compare the two distributions. What inferences can you draw about the lengths of words in the two textbooks?

MAFS.7.SP.2.4-FSA Practice

Neutral-Questions for this standard may or may not allow the use of a calculator.

1. Mr. O is teaching a class that students can access in person or online. Mr. O is curious about how much time his online students spend on his class compared to his in-person students. Mr. O randomly selects 10 in-person students and 10 online students and asks them to record all the time that they spend on his class for one week, yielding the results below.

   Based on the center and variability of each distribution, what inferences can you draw about the two populations?



2. Mr. P is a sales executive who is curious about the effectiveness of calling and emailing for acquiring new customers. Mr. P randomly selects two groups of 10 salespeople. For one week, he has the first group do only emailing, and he has the second group do only calling. Each salesperson records the number of new customers they have signed up, yielding the results below.

Based on the center and variability of each distribution, what inferences can you draw about the two populations?

MAFS.7.SP.3.5

Neutral-Questions for this standard may or may not allow the use of a calculator.

1. Which of the following numbers could represent the probability of an event? For each, explain why or why not.

	Probability of an Event?	Yes	No	Explanation
A.	-1			
B.	4.2			
C.	0.6			
D.	0.888			
E.	0			
F.	0.39			
G.	-0.5			

2. What does each probability mean about the likelihood of an event occurring? Is the event likely, unlikely, or neither likely nor unlikely?

A. 1

B. $\frac{1}{100}$

C. 0

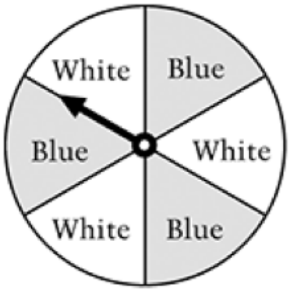
D. $\frac{1}{2}$

E. $\frac{9}{10}$

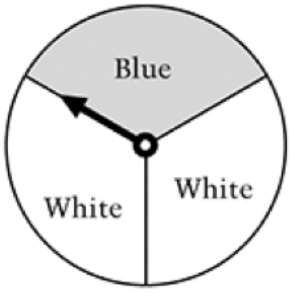
3. In a gumball machine there are 100 red, 75 blue, 50 green, and 125 yellow gumballs. These 350 gumballs are mixed up. Sam puts money in and one gumball comes out. Which color is most likely to come out?

A. Red
B. Blue
C. Green
D. Yellow

4.



Spinner A



Spinner B

Lori has a choice of two spinners. She wants the one that gives her a greater probability of landing on blue.

Which spinner should she choose?

○ Spinner A ○ Spinner B

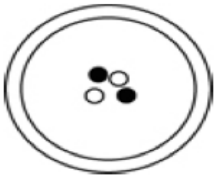
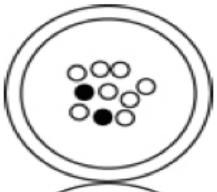
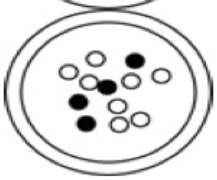
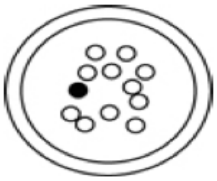
Explain why the spinner you chose gives Lori the greater probability of landing on blue.

5.

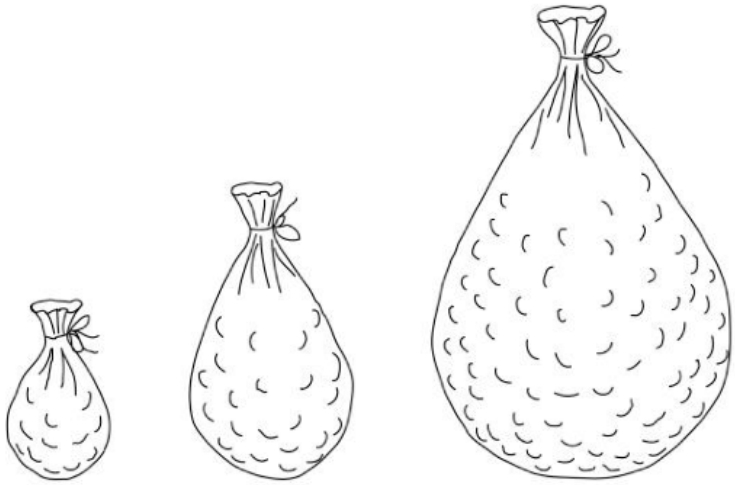
Stickers	Number
Red	III
Blue	IIII
Yellow	II
Green	~~IIII~~ II

The 16 stickers listed above are placed in a box. If one sticker is drawn from the box, which color is it most likely to be?

A. Red
B. Blue
C. Yellow
D. Green

	MAFS.7.SP.3.5-FSA Practice	**Neutral-Questions for this standard may or may not allow the use of a calculator.**
1.	In each scenario for Questions 1-3, a probability is given. Describe each event as likely, unlikely, or neither likely nor unlikely. Explain your choice of description. The probability of a hurricane being within 100 miles of a location in two days is 40%.	
2.	The probability of a thunderstorm being located within 5 miles of your house sometime tomorrow is $\frac{9}{10}$.	
3.	The probability of a given baseball player getting at least three hits in the game today is 0.08.	
4.	A person is going to pick one marble without looking. For which dish is there the greatest probability of picking a black marble? A.  B.  C.  D. 	

5. There is only one red marble in each of the bags shown below. Without looking, you are to pick a marble out of one of the bags. Which bag would give you the greatest chance of picking the red marble?



10 marbles 100 marbles 1000 marbles

A. Bag with 10 marbles
B. Bag with 100 marbles
C. Bag with 1000 marbles
D. It makes no difference

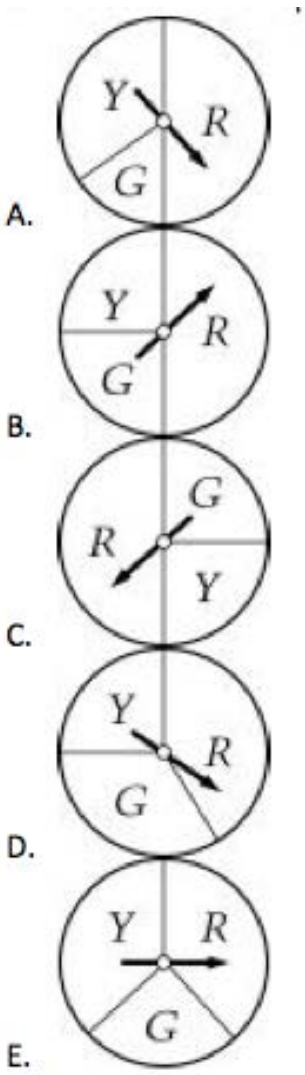
	MAFS.7.SP.3.6	**Neutral-Questions for this standard may or may not allow the use of a calculator.**
1.	Reagan will use a random number generator 1,200 times. Each result will be a digit from 1 to 6. Which statement **best** predicts how many times the digit 5 will appear among the 1,200 results? Ⓐ It will appear exactly 200 times. Ⓑ It will appear close to 200 times but probably not exactly 200 times. Ⓒ It will appear exactly 240 times. Ⓓ It will appear close to 240 times but probably not exactly 240 times.	
2.	For the past three months, Sydney recorded the number of eggs that her hen laid each week. The results are as follows: 4, 3, 5, 4, 6, 4, 5, 4, 3, 5, 7, and 6. Approximate the probability that the hen will lay exactly five eggs next week.	
3.	Approximate the probability that the hen will lay four or fewer eggs the next week.	
4.	A quarter is flipped 50 times. Which of the following is most likely to be the number of times heads comes up? A. 2 B. 3 C. 11 D. 26 E. 50	

5.

RESULTS

G	157
Y	352
R	491

Jerry spun one of the spinners below 1,000 times and obtained the results shown in the table above. Which spinner did Jerry probably use?



	MAFS.7.SP.3.6-FSA Practice	**Neutral-Questions for this standard may or may not allow the use of a calculator.**
1.	A bag contains green marbles and purple marbles. If a marble is randomly selected from the bag, the probability that it is green is 0.6 and the probability that it is purple is 0.4. Dylan draws a marble from the bag, notes its color, and returns it to the bag. He does this 50 times. How many times would you expect Dylan to draw a green marble?	
2.	Is it possible for Dylan to draw a green marble exactly five times? Explain your reasoning.	

3. Olivia rolled two number cubes with sides numbered one through six. The sum of the two numbers she rolled was eight, and the probability of getting a sum of eight is $\frac{5}{36}$. The probability of getting other possible sums when two number cubes are rolled is given in the table.

Estimate the number of times that the sum will be 10 if the two number cubes are rolled 600 times. Show work and explain.

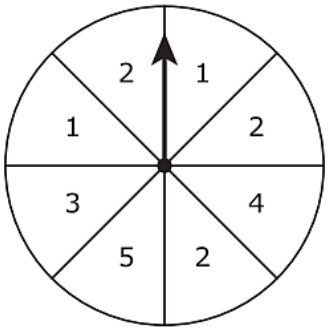
Sum	Probability
2	$\frac{1}{36}$
3	$\frac{1}{18}$
4	$\frac{1}{12}$
5	$\frac{1}{9}$
6	$\frac{5}{36}$
7	$\frac{1}{6}$
8	$\frac{5}{36}$
9	$\frac{1}{9}$
10	$\frac{1}{12}$
11	$\frac{1}{18}$
12	$\frac{1}{36}$

4. If Olivia rolls the number cubes 600 times, do you think she will get exactly the number you calculated? Why or why not?

MAFS.7.SP.3.7

A CALCULATOR IS ALLOWED

1. The spinner face shown is divided into 8 equal sections.



The arrow on this spinner is spun once.

What is the probability that the arrow will land on a section labeled with a number **greater** than 3?

Ⓐ $\frac{1}{8}$

Ⓑ $\frac{1}{4}$

Ⓒ $\frac{1}{3}$

Ⓓ $\frac{1}{2}$

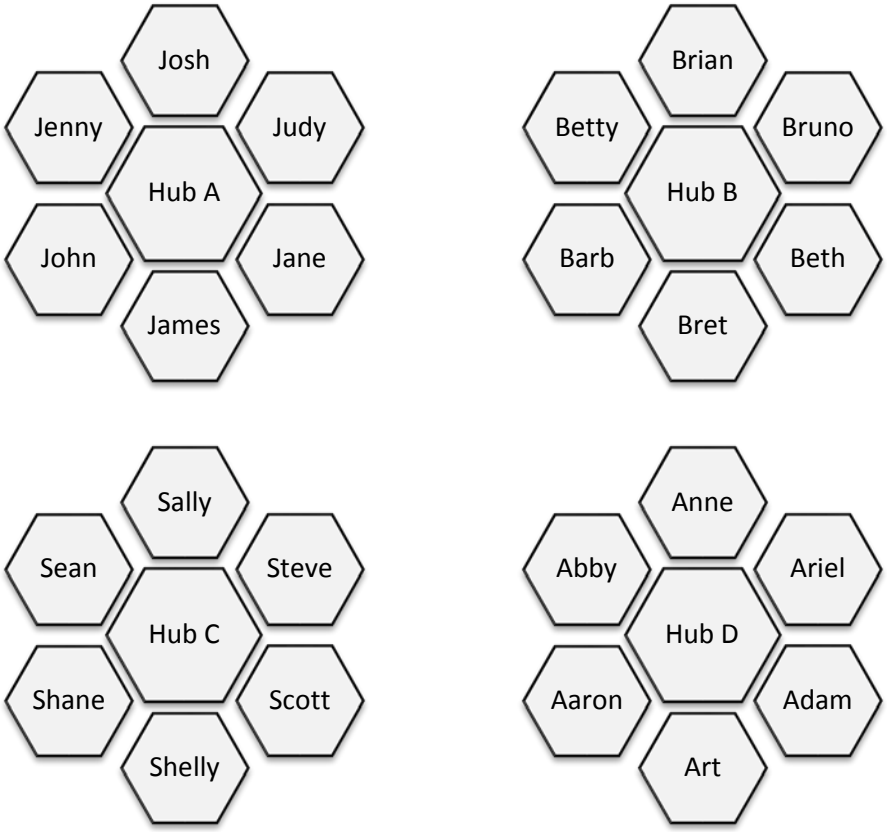
2. Susan put blue tiles, green tiles, and yellow tiles into a bag. All the tiles are the same size and shape. Susan will select one tile from the bag without looking, record its color, and then put the tile back into the bag. She will repeat this experiment 240 times. Based on the number of tiles of each color in the bag, Susan predicted the results shown in the frequency table below.

Predicted Results

Color of Tile	Frequency
blue	120
green	40
yellow	

A total of 12 tiles are in the bag.

Based on the table, what is the best prediction for the number of times Susan will select a yellow tile from the bag? Show or explain how you got your answer.

3.	Based on the table, determine the number of blue tiles, the number of green tiles, and the number of yellow tiles that are in Susan's bag. Show or explain how you got **each** of your answers.
4.	Use the seating chart for Mr. Elroy's Computer Science class (shown below) to answer the questions.  Suppose one of the computers was delivered with a defective monitor. What is the probability that Sally was assigned that computer with the defective monitor?

7th Grade

MAAP Tested Domains

Performance Tasks

State-Tested Performance Task Standard

Task #1: Cereal

Here is some information from the side of the two boxes of cereal:

Tasty Oats
12 grams of protein in 100 grams of cereal

Cornbits
5 grams of protein in 45 grams of cereal

1. How many grams of Tasty Oats cereal will give you 9 grams of protein? Show your work. _____ grams

2. Which cereal, Tasty Oats or Cornbits, has the higher ratio of protein? _____

   Explain how you figure it out.

   _____

   _____

   _____

   _____

State-Tested Performance Task Standard

Task #2: What's the Catch?

Your parents have agreed to let you get a cell phone, finally! The catch is you have to research the plans available and decide which one would give you the best value.

Phone Co.	Monthly	Cost/# of Messages
Snappy & Co.	$0	$0.25/message
Venti Mobile	$20	$0.15/message
Cheshire Wireless	$0	$0.50/2 messages
Ritzy Cellular	$30	$0.10/message

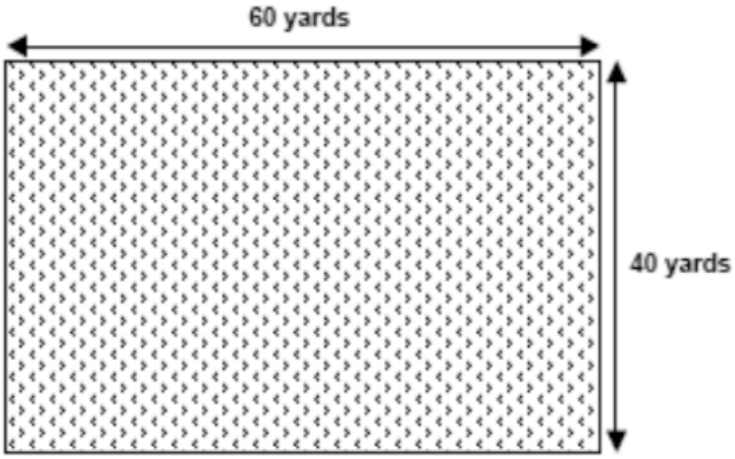
1. Which plan would fit your needs best if you send between 0 and 100 messages each month?

2. Which plan would fit your needs if you send over 200 messages each month?

3. Make three observations about the plans, using math vocabulary, graphs, or tables.

State-Tested Performance Task Standard

Task #3: Lawn Mowing



Dan and Alan take turns cutting the grass. Their lawn is 60 yards long and 40 yards wide.

1. What is the area of the yard? _____

   Dan takes an hour to cut the lawn using an old mower.

2. How many square yards does Dan cut in a minute? Show your work.

Alan only takes 40 minutes using a new mower.

3. How many square yards does Alan cut in a minute? Show your calculation.

4. One day they both cut the grass together. How long do they take? How did you figure it out?

State-Tested Performance Task Standard

Task #4: Cat Food

Carol has two cats, Rover and Bobo.

1. Rover eats $\frac{3}{4}$ of a can of cat food each day and Bobo eats $\frac{1}{2}$ of a can of cat food each day. Cat food costs $5.00 for three cans. It is only sold in 3 can packs. How much does it cost Carol for a 60-day supply of cat food for her two cats? Show your work.

2. Find the cost of cat food for a 29-day supply, a 30-day supply, and a 31-day supply. Show your work.

   29-day supply: _____

   30-day supply: _____

   31-day supply: _____

State-Tested Performance Task Standard

Task #5: Mixing Paints

Wayne is mixing paint. He makes six quarts of brown paint by mixing equal quantities of yellow paint and violet paint. The violet paint is made from one-third red paint and two-thirds blue paint.

1. How much red paint does he use?

2. How much blue paint does he use?

3. What percentage of the brown paint is made from the blue paint? Explain.

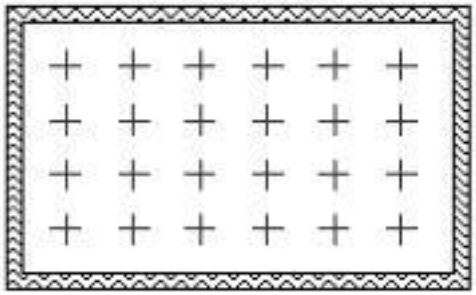
State-Tested Performance Task Standard

Task #6: Linflower Seeds

Tim grows linflowers from seeds. But not all of his seeds start to grow. He has found that for every 100 seeds he sows, only about 75 start to grow.

1. Tim sows 20 linflower seeds. How many would you expect to grow? Explain your reasoning.

2. Tim sows 24 seeds in a box. Each mark on the box below shows the position of a seed.



Guess which of the seeds start to grow. Draw circles around the seeds that do *not* start to grow. (Note: There is more than one correct way to show your answer to this question.)

Explain your reasoning.

State-Tested Performance Task Standard

Task #7: Miguel's Milkshakes

Miguel plans to make milkshakes for a party. The grocery store only sells four sizes of milk at the following prices:

$\frac{1}{4} gallon = \$1.80 \quad \frac{1}{2} gallon = \$2.10 \quad 1\ gallon = \$4.25 \quad 2\ gallons = \$5.98$

1. Describe the better buy if you plan to buy lots of milk. Support your answer with tables, graphs, equations, diagrams, and/or verbal descriptions.

2. Suppose Miguel needed 3 gallons of milk. If he wants to spend the least amount of money, using any combination of the four sizes above, how much will he spend? Prove that your method guarantees Miguel will spend the least amount of money.

State-Tested Performance Task Standard

Task #8: Photos

The *aspect ratio* of a photograph is the ratio of the photograph's width to its height.

1. Which of the ratios listed below correctly represents the aspect ratio of this 8-inch wide by 12-inch high baby photo? Circle each correct ratio.

8:12	12: 8	4:6	2:3
3:2	1:1.5	16:24	24:36

2. Choose one of the ratios that you circled and explain why it is correct.

3. Choose a ratio that you did not circle and explain why it is incorrect.

Task #1: Cereal—KEY

How many grams of Tasty Oats cereal will give you 9 grams of protein? Show your work. 75 grams

100 x $\frac{3}{4}$

Which cereal, Tasty Oats or Cornbits, has the higher ratio of protein?

Ratio of protein in Tasty Oats = $\frac{12}{100} = 0.12$

and

Ratio of protein in Cornbits =$\frac{5}{45} = 0.111$

Task #2: What's the Catch?—KEY

Which plan would fit your needs best if you send between 0 and 100 messages each month?

Students may make a table showing the calculated monthly costs for different numbers of messages on different plans. They should notice that the values for the Snappy and Cheshire companies are the same when the customer sends 100 or fewer messages.

Which plan would fit your needs if you send over 200 messages each month?

From a table, calculating the per month cost for different numbers of messages on different plans, students should notice that Snappy and Cheshire become more expensive than the other two companies when the customer sends 200 or more messages.

Make three observations about the plans, using math vocabulary, graphs, or tables.

Answers will vary, but some examples might include: vocabulary like *proportionality*. From a graph, since Snappy and Cheshire go through the origin, they represent proportional relationships, since the rate for each message would be the same regardless of how many messages were sent. Venti and Ritzy, however, are not proportional since they do not pass through the origin.

Task #3: Lawn Mowing—KEY

What is the area of the yard? 2400 square yards

Dan takes an hour to cut the lawn using an old mower.

How many square yards does Dan cut in a minute? Show your work.

$$(60\ x\ 40) \div 60 = \ 40\ square\ yards\ per\ minute$$

Alan only takes 40 minutes using a new mower.

How many square yards does Alan cut in a minute? Show your calculation.

$$(60\ x\ 40) \div 40 = \ 60\ square\ yards\ per\ minute$$

One day they both cut the grass together. How long do they take? How did you figure it out?

In one minute, together they mow $40\ +\ 60 = 100\ square\ yards$: $(60\ x\ 40) \div 100\ =\ \mathbf{24\ minutes}$

Task #4: Cat Food—KEY

Carol has two cats, Rover and Bobo.

Rover eats $\frac{3}{4}$ of a can of cat food each day and Bobo eats $\frac{1}{2}$ of a can of cat food each day. Cat food costs $5.00 for three cans. It is only sold in 3 can packs. How much does it cost Carol for a 60-day supply of cat food for her two cats? Show your work. **$125**

Number of cans = $60\ x\ 1.25 = 75$

Cost in dollars= $75 \div 3\ =\ \$25$

Find the cost of cat food for a 29-day supply, a 30-day supply, and a 31-day supply. Show your work.

29-day supply: **$65**

number of cans = 29 29 x 1.25 = 36.25 (round to 39) cost in =39÷3=$13 13x5=65

30-day supply: **$65**

number of cans = 30 30 x 1.25 = 37.5 (round to 39) cost in =39 ÷3=$13 13x5=65

31-day supply: **$65**

number of cans = 31 31 x 1.25 = 38.75 (round to 39) cost in =39÷3=$13 13x5=65

Comments that all these answers are the same because the number of cans needs to be rounded to a number that can be divided by 3.

Task #5: Mixing Paints—KEY

Wayne is mixing paint. He makes six quarts of brown paint by mixing equal quantities of yellow paint and violet paint. The violet paint is made from one-third red paint and two-thirds blue paint.

How much red paint does he use? **Red = 1 quart**

How much blue paint does he use? **Blue = 2 quarts**

What percentage of the brown paint is made from the blue paint? Explain.

33%. He uses three quarts each of yellow and violet. In 3 quarts of violet there is one quart of read and 2 quarts of blue. The percent of blue $\frac{2}{6}\ x\ 100 = 33.3\%$

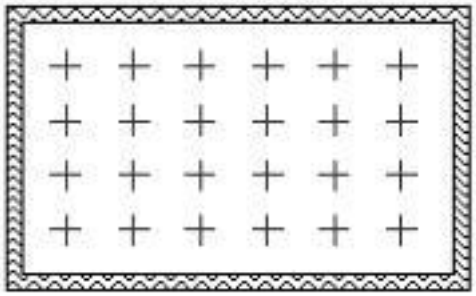
Task #6: Linflower Seeds—KEY

Tim grows linflowers from seeds. But not all of his seeds start to grow. He has found that for every 100 seeds he sows, only about 75 start to grow.

Tim sows 20 linflower seeds. How many would you expect to grow? Explain your reasoning.

75 out of 100 is 75 percent. Therefore, 100 x 0.75 **OR** $\frac{75}{100} = \frac{3}{4}$ so 20 x 0.75=**15**

Tim sows 24 seeds in a box. Each mark on the box below shows the position of a seed.



Guess which of the seeds start to grow. Draw circles around the seeds that do not start to grow. (Note: There is more than one correct way to show your answer to this question.)

Explain your reasoning. Student circles 6 marks. The student should explain that 25% or $\frac{1}{4}$ will not grow. Thus, $\frac{1}{4}\ of\ 24 = 6$.

Task #7: Miguel's Milkshakes—KEY

Miguel plans to make milkshakes for a party. The grocery store only sells four sizes of milk at the following prices:

$\frac{1}{4} gallon = \$1.80 \quad \frac{1}{2} gallon = \$2.10 \quad 1\ gallon = \$4.25 \quad 2\ gallons = \$5.98$

Describe the better buy if you plan to buy 2 or more gallons of milk. Support your answer with tables, graphs, equations, diagrams, and/or verbal descriptions.

Student response should identify that the 2 gallons of milk for $5.98 is the best buy. For example, comparing each case for at least two gallons, students would have the following:

¼ gallon of milk $7.20 ($1.80 x 4)
½ gallon of milk $4.20 ($2.10 x 2)
1 gallon of milk $4.25 ($4.25 x 1)
2 gallons of milk $2.99 ($5.98 ÷ 2)

Suppose Miguel needed 3 gallons of milk. If he wants to spend the least amount of money, using any combination of the four sizes above, how much will he spend? Prove that your method guarantees Miguel will spend the least amount of money.

Student gives correct answer: The least amount of money Miguel will spend for 3 gallons of milk is $10.18. Students should justify their response by stating that the quantities with the lowest unit rates will produce the least expensive purchase.

Task #8: Photos—KEY

The *aspect ratio* of a photograph is the ratio of the photograph's width to its height.

1. Which of the ratios listed below correctly represents the aspect ratio of this 8-inch wide by 12-inch high baby photo? Circle each correct ratio.

8:12	12: 8	4:6	2:3
3:2	1:1.5	16:24	24:36

2. Choose one of the ratios that you circled and explain why it is correct.
   See student's response as it relates to equivalent ratios.

3. Choose a ratio that you did not circle and explain why it is incorrect.
   See student's response. Any ratio not selected can be viewed as one that is not an equivalent ratio.