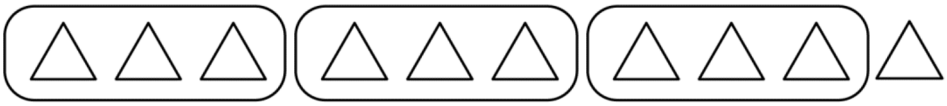
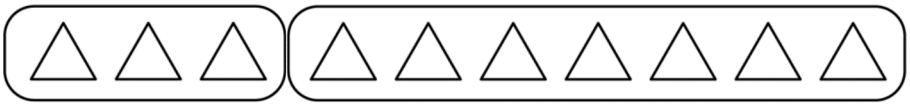
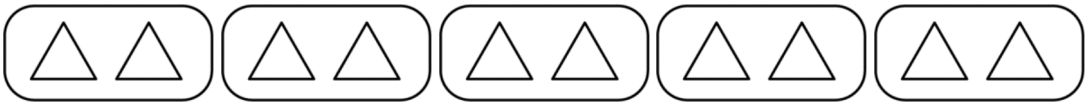
(1) Select the picture that shows why 10 is an even number.

Picture 1: 

Picture 2: 

Picture 3: 

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(2) Which number has more than 5 bundles of ten tens?

A. 608 B. 419 C. 287 D. 236

(3) Lara and Jake each showed how they added 7 and 5 using mental math. Their work is shown below. Did each student show a correct or incorrect way to add 7 and 5?

Choose correct or incorrect for each.

	Correct	Incorrect
Lara: 7 + 5 7 + 3 + 2 10 + 2 12	❍	❍
Jake: 7 + 5 is equal to 5 + 7 5 + 7 5 + 5 + 2 10 + 2 12	❍	❍

(4) Which word problem represents the equation $49 \div \square = 7$?

A. Jack had 49 stickers. He gave Sally some of his stickers. Jack had 7 stickers left. How many stickers did Jack give Sally?

B. Jane made 49 paper flowers. Jane asked her friend to make 7 flowers for her. How many flowers do Jane and her friend have altogether?

C. Johnny asked 7 friends to each pick 49 flowers from a field. How many flowers do Johnnys friends have altogether?

D. Jamila gave a total of 49 pencils to 7 friends. She gave an equal number of pencils to each friend. How many pencils was each friend given?

(5) Draw lines to match each whole number on the left with all equivalent fractions on the right. There may be more than one fraction for a whole number.

Whole Number	Fraction
1	$\frac{2}{1}$
2	$\frac{5}{5}$
3	$\frac{2}{2}$
4	$\frac{8}{8}$
	$\frac{3}{1}$
	$\frac{4}{1}$

(6) Select the numbers below that have a value of 950,000 when rounded to the nearest ten thousand.

944,806 953,782 956,270 945,867

947,603

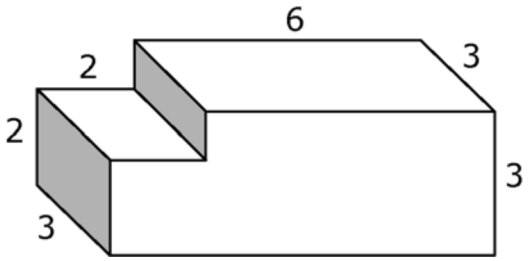
(7) Mr. Bruno ordered 78 pencils for the students in his class. He ordered enough pencils for each student to have exactly 3 pencils. How many students are in Mr. Brunos class?

Use a letter to represent the number of students in Mr. Brunos class. Write an equation and use it to solve the word problem.

(8) The number 5.267 will be rounded to the nearest hundredth. Between what two hundredths does 5.267 lie? Show these two values by placing numbers in the boxes below the number line. Place a point on the number line to show 5.267.

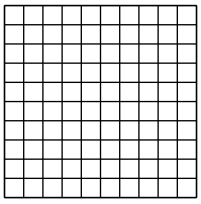
Explain why your answer is correct.

(9) The solid below is made from two non-overlapping right rectangular prisms. What is the volume of the solid?



A. 28 B. 55 C. 66 D. 72

(10) Show how to use the grid below to model 0.6×0.3.



What is the value of 0.6×0.3 ?

(11) Water has a freezing temperature of 0 degrees Celsius.

- Castor oil has a freezing temperature that is 18 degrees Celsius less than the freezing temperature of water.
- Palm oil has a freezing temperature that is 24 degrees Celsius more than the freezing temperature of water.
- Corn oil has a freezing temperature that is 20 degrees Celsius less than the freezing temperature of water.

Which of the following oils have freezing temperatures, in degrees Celsius, that are negative numbers?

A. Corn oil only

B. Castor oil and palm oil only

C. Castor oil and corn oil only

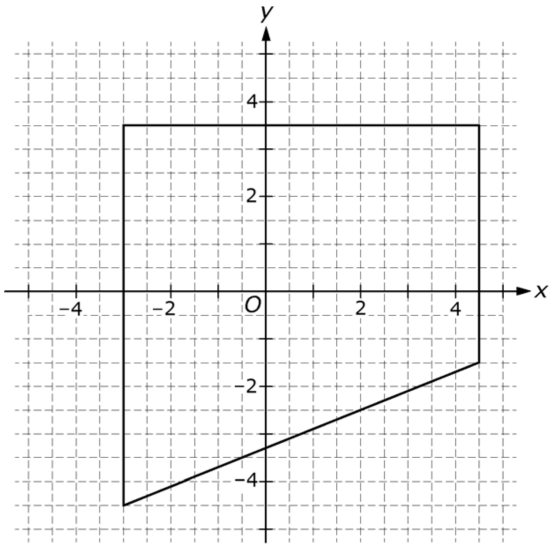
D. Castor oil, palm oil, and corn oil

(12) Look at the number line shown below.

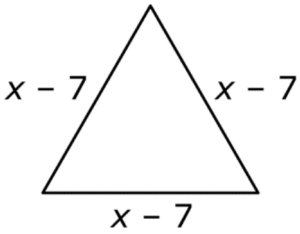
Which word problem or inequality could have a solution represented by the number line? Select all the word problems or inequalities that apply.

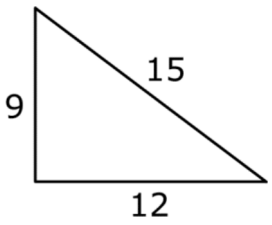
- ❍ Christopher has read for more than 32 minutes.
- ❍ Christopher has read for less than 32 minutes.
- ❍ Christopher has read for 32 minutes.
- ❍ $x < 32$
- ❍ $x > 32$
- ❍ $x = 32$

(13) Kylie fenced off part of her barnyard to keep her chickens safe. The part of the barnyard that she fenced off is represented on the coordinate plane below, where the units are in feet. What is the area, in square feet, of the part of the barnyard that she fenced off? Explain how you found your answer.



(14) The perimeters of the triangles shown below are equal. Which of the following equations can be used to find the value of x?

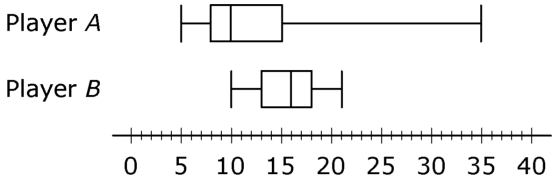




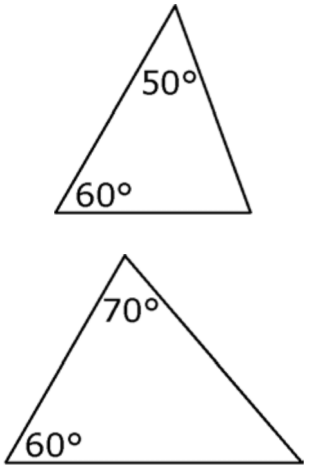
A. $3x - 7 = 36$ B. $3x - 7 = 54$

C. $3(x - 7) = 36$ D. $3(x - 7) = 54$

(15) The parallel box plots below describe the number of home runs hit by Player *A* and Player *B* in each of the last 11 baseball seasons. Based on the information shown, which player is more likely to hit a greater number of home runs next season? Explain your answer.



(16) Are the two triangles shown below similar triangles? Explain your answer.



(17) Alice bought a new cell phone. The cell phone company she bought the phone from charges $50 per month for cell phone service, $200 for the new phone, and a fee of $175 if the contract is terminated before 2 years have expired. Which of the following linear equations models Alice's total cost in dollars, y, as a function of the number of months after she purchased the phone, x, if she terminates her contract before 2 years?

A. $y = 50x + 200$ B. $y = 50x + 375$

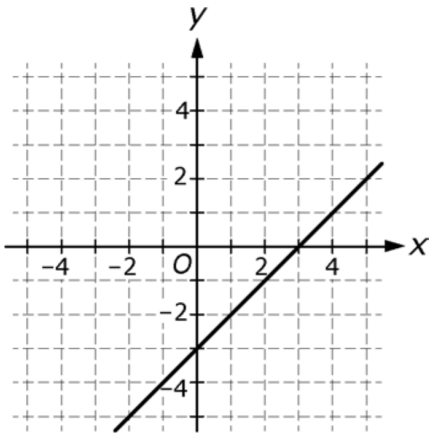
C. $y = 175x + 50$ D. $y = 375x + 50$

(18) Indicate whether each statement about linear functions *A* and *B* shown below is true or false by marking the appropriate box in the table.

Function *A*

x	y
1	3
2	7
3	11
4	15
5	19

Function *B*



	True	False
The rates of change for both function *A* and function *B* are positive.	❍	❍
The rate of change for function *A* is 3 times the rate of change for function *B*.	❍	❍
The *y*-intercepts for both function *A* and function *B* are positive.	❍	❍

(19) Solve the equation $(t - 7)^2 + 18 = 9$ for t. Show your work.

(20) The graph below shows ages of employees in a company and average salaries for that age.

Based on the graph, indicate whether each of the three statements below is true or false. Select your answer under each statement.

There is a fairly strong positive correlation between age and salary.

True False

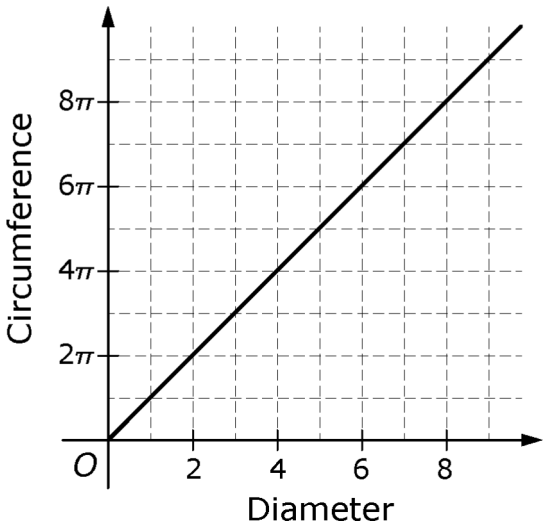
The data shows that salaries are higher for the older employees.

True False

An employees age causes his or her salary to be higher or lower.

True False

(21) The graph below shows the relationship between the circumference and diameter of circles with various radii.



Explain how the graph suggests that all circles are similar.

(22) Classify each of the following pairs of lines as parallel, perpendicular, or neither.

Lines	Parallel/Perpendicular/Neither
$3y = -5x - 5$ $(y - 7) = 0.6(x - 5)$	
$2x + 3y = 4$ $4x + 5y = 6$	
$y = 4x + 1$ $(y - 2) = 4(x - 3)$	
$y = -3x + 5$ $9x + 3y = 2$	

(23) A farmer is to enclose a rectangular pasture (that measures ℓ meters by w meters) with a total of 240 meters of fencing. The area of the rectangular pasture is A square meters. The farmer wants to know the values of ℓ and w that maximize the value of A.

Part A

Write a formula for ℓ in terms of w.

Part B

Write a formula for A in terms of w.

Part C

Find a value of w that maximizes the value of A. For this value of w, find the corresponding value of ℓ.

(24) A ball is dropped, and for each bounce after the first bounce the ball reaches a height that is a constant percent of the preceding height. After the first bounce it reaches a height of 10 feet, and after the third bounce it reaches a height of 4.9 feet.

Part A

The height the ball reaches after the nth bounce is represented by a_n below. Write the value for each a_n below.

a_1 = 10 feet

a_2 = ____

a_3 = 4.9 feet

a_4 = ____

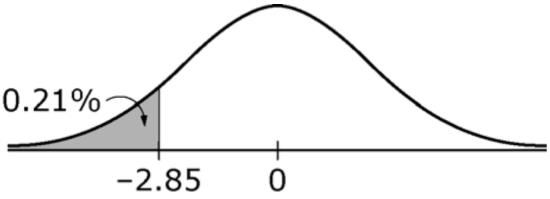
a_5 = ____

Part B

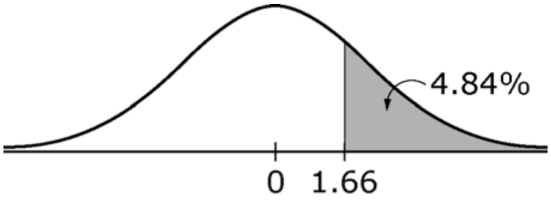
Write an explicit rule for the height after the nth bounce, a_n, where n represents the bounce number.

(25) Consider the following two properties of a normal distribution with mean 0 and standard deviation 1. In each case, the shaded region under the curve represents the percent of the observations that satisfy the property.

Property 1: About 0.21% of the observations are 2.85 standard deviations or more below the mean.



Property 2: About 4.84% of the observations are 1.66 standard deviations or more above the mean.



In the graph below, shade and label the region under the curve that represents the observations that are between 1.66 and 2.85 standard deviations *above* the mean. What percent of the observations are between 1.66 and 2.85 standard deviations above the mean? Explain your answer.