

SBA

Grade 9

Mathematics Practice

(9)N-2 The student demonstrates understanding of real numbers by equating different equivalent representations of the same exponential expression.

1. Write an expression equivalent to $5^2 \cdot 5^3 \cdot 5$.

- a.) 5^5 b.) 125^5 c.) 5^6 d.) 25^6

2. Write an expression equivalent to $\frac{3^4}{3^2 \cdot 3^3}$.

- a.) $\frac{1}{3}$ b.) 3 c.) $\frac{1}{9}$ d.) 9

3. Write an expression equivalent to $\frac{12x^3 \cdot x^6}{6x^7}$, using only positive exponents.

(9)N-3 The student demonstrates conceptual understanding of mathematical operations by describing or illustrating the effects of arithmetic operations on real numbers.

1. Evaluate the expression: $|-2| + |12 - 5|$

- a.) 19 b.) 9 c.) 5 d.) -5

2. Evaluate each of the following expressions:

a.) $-3.75 + (-2.5)$

b.) $-26 + 39$

c.) $36 - (-42)$

3. Simplify $(-3)^2 - \frac{(-2)(-24)}{-16}$

- a.) 12 b.) -6 c.) -12 d.) 6

(9)N-4 The student demonstrates conceptual understanding of mathematical operations by describing or illustrating the use of inverse operations (squaring/square root).

1. Steve has 81 square feet of decking to make a deck. If he wishes the deck to be square, how long should he make each side of the deck?
(Draw a picture and explain how you arrived at your answer.)

2. You have been asked to paint 50 square sections that will be used to make a fence. Each section is 5 feet by 5 feet. Figure out the total square footage you will be painting so you know how much paint to purchase.
(Draw a picture and show all the steps you take to find your answer.)

3. Simplify:

a.) $\sqrt{121}$ _____

b.) $\sqrt{49}$ _____

c.) $\sqrt{225}$ _____

d.) $\sqrt{1}$ _____

e.) $\sqrt{144}$ _____

4. Simplify:

a.) 6^2 _____

b.) 8^2 _____

c.) 25^2 _____

d.) -4^2 _____

e.) $(-4)^2$ _____

(9)N-5 the student demonstrates conceptual understanding of number theory by applying the rules for order of operations to real numbers and variables.

1. Simplify: $6 - 4(6 + 2)$

2. Simplify: $\frac{-3(4 - 9)}{35 \div -7}$

3. Simplify: $3 + 2(x - 5)$

4. Simplify: $3x + 10^2(5 + 4x)$

a.) $7x + 500$

b.) $403x + 500$

c.) $x + 500$

d.) $112x$

(9)MEA-1 The student demonstrates understanding of measurable attributes by estimating or converting measurements between the English and metric systems in real-world applications, given a conversion factor (e.g. miles/kilometers).

1. Henry is running a 5-K race, which means he is running 5 kilometers.

a.) How many meters is a 5-K race? (1 kilometer = 1000 meters)

b.) How many feet is a 5-K race? (1 meter \approx 3.28 feet)

2. The first Olympic games were held in 776 B.C. Foot races were held on the 4th day of the Games. The shortest race was called the stade, which was about the length of the stadium or about 600 feet. How many meters long was this race?

a.) 1968 m

b.) 183 m

c.) 633 m

d.) 1376 m

3. If you rode your bicycle 600 meters, how many feet would you have ridden?

a.) 1968 ft

b.) 183 ft

c.) 633 ft

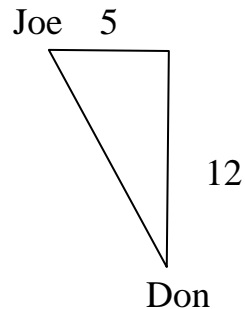
d.) 1376 ft

(9)MEA-2 The student uses measurement techniques by applying indirect methods, such as the Pythagorean theorem to find missing dimensions in real-world applications.

1. Your cat, Friskers, is stuck in a tree. You have a ladder that is 10 feet long. There is a planter beside the tree that will not allow you to place your ladder closer than 6 feet from the tree. If Friskers is 8 feet up in the tree, is your ladder long enough to rescue the cat?

(Draw a picture, use the Pythagorean theorem, and explain how you arrived at your answer.)

2. Joe and Don are playing football. Joe runs straight for 12 yards, turns left and runs another 5 yards to receive Don's pass. How far does Don have to throw the football for Joe to be able to make the catch?



a.) 13 yds

b.) 17 yds

c.) 119 yds

d.) 7 yds

3. TV's are measured on the diagonal. Harry's big screen is a 55" TV. If the width of the TV is 33", what is the length?

a.) 22"

b.) 88"

c.) 44"

d.) 66"

(9)E&C-1 The student solves problems (including real-world situations) using estimation by judging whether the strategy will result in an answer greater or less than the exact answer.

1. Amelia is buying Halloween candy at the Candy Emporium. The cost of candy is \$3.89 a pound. Amelia estimates the total weight of her candy to be about $2\frac{3}{4}$ pounds.

a.) Round the price, \$3.89, and the weight, $2\frac{3}{4}$, to whole numbers.

$$\$3.89 \approx \underline{\hspace{2cm}} \qquad 2\frac{3}{4} \approx \underline{\hspace{2cm}}$$

b.) Use the rounded numbers to estimate the total price.

$$\text{Total price} \approx \underline{\hspace{2cm}}$$

c.) Will your estimate be higher or lower than the actual cost?
Explain your answer.

2. Suki was asked to find $\frac{5}{8}$ of \$124. For each of the following, state whether the estimate will be greater or less than the exact answer.

a.) Her estimate is $\frac{3}{4}$ of \$124.

b.) Her estimate is $\frac{1}{2}$ of \$124

3. About how many hours are there in one year? (Follow these steps.)

a.) How many days are there in a year?

b.) How many hours are there in a day?

c.) If you round your numbers from part a) and b) to the nearest ten, will your answer be higher or lower than the actual number of hours in a year?

(9)E&C-2 The student accurately solves problems (including real-world situations) involving adding or subtracting rational numbers including integers with whole number exponents.

1. Give the value of the expression: $-15.25 + 3^2 - 2^4$

a.) -14.25

b.) -22.25

c.) 9.75

d.) -4.25

2. Simplify: $(-7)^2 + (9)^2 - 3.9$

a.) 28.1

b.) 126.1

c.) 0.1

d.) 63.1

3. Simplify: $\left(\frac{2}{3} + \frac{1}{4}\right)^2$ Show all steps and answer in fraction form.

(9)E&C-3 The student accurately solves problems (including real-world situations) involving multiplying or dividing rational numbers including integers with whole number exponents.

1. Find the quotient: $864.2 \div 2^3$

- a.) 144.03333 b.) 432.1 c.) 108.025 d.) 6913.6

2. Find the product: -2.09×3^2

- a.) -18.81 b.) -12.54 c.) 18.81 d.) 12.54

3. $2^3 \cdot (-5)^2 =$ _____

- a.) -60 b.) 60 c.) -200 d.) 200

4. $3^3 \div 6 =$ _____

- a.) $3/2$ b.) 3 c.) $9/2$ d.) None of the above

(9)E&C-4 The student accurately solves problems (including real-world situations) involving determining rate by using ratio and proportion.

1. Shakira drove 372 miles in 6 hours.

A.) What was her average rate?

- a.) 2232 mph b.) 62 mph c.) 10.33 mph d.) 55 mph

B.) If she continues at the same rate, how long will it take her to drive another 155 miles?

- a.) 2.5 hrs. b.) 3 hrs. c.) 10 hrs. d.) 2 hrs.

2. Elle is planning a long bicycle trip. She can travel 65 miles each day. At this rate, how many days will it take her to go 520 miles?

- a.) 585 days b.) 455 days c.) 8 days d.) 12 days

3. Maury's Rental Car rents a car at the rate of \$228 for 4 days. At this rate, what would it cost to rent the same car for 9 days?

- a.) \$456 b.) \$513 c.) \$114 d.) \$101.33

(9)F&R-1 The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by describing or extending patterns (families of functions: linear, quadratic, absolute value) up to the nth term, represented in tables, sequences, graphs, or in problem situations.

1. Given the following table, fill in the blanks.

x	1	2	3	4	5	6	...	n
y	0	3	8	15				

2. Given the following series, fill in the three missing numbers and describe how to find the nth term.

1,1,2,3,5,8,13,__,__,__,...n

3. Hollister accepts a job housekeeping for Mrs. Cavendagh and agrees to the following payment schedule. On the first day Hollister receives one cent, the second day he receives two cents, the third day he receives four cents, the fourth day he receives eight cents. Mrs. Cavendagh continues to pay Hollister according to this pattern for the entire month of February.

- How much has Hollister received after the first week?
- How much did Hollister earn on his tenth day of employment?
- Describe the rule that explains how much Hollister receives each day.

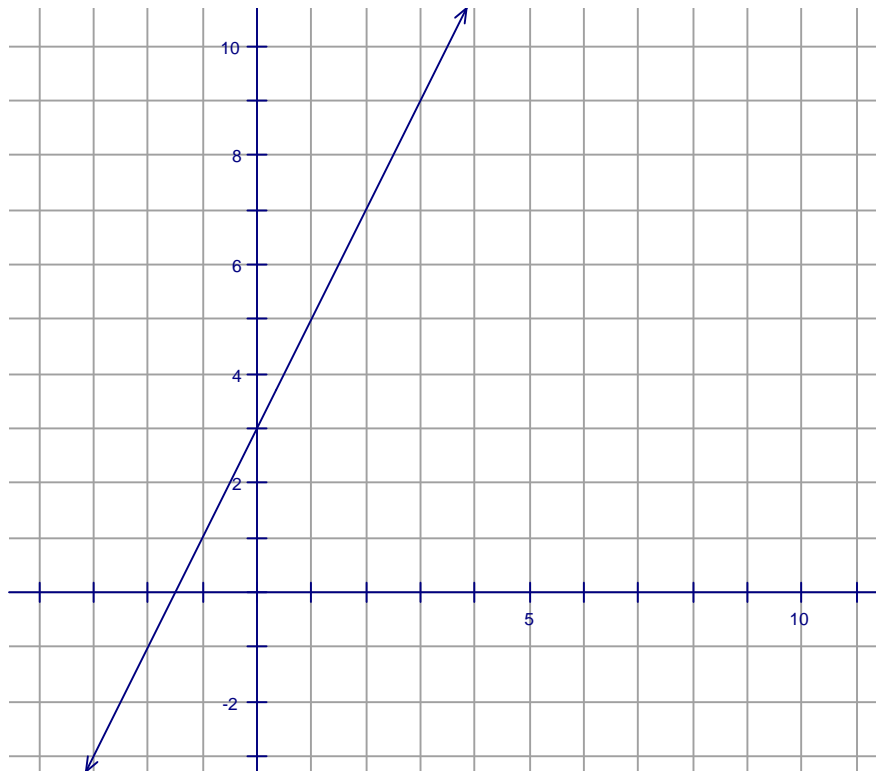
(9)F&R-2 The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by generalizing relationships (linear, quadratic, absolute value,) using a table of ordered pairs, a graph, or an equation.

1. Which equation could have produced the following table?

x	-3	-2	-1	0	1	2	3
y	11	6	3	2	3	6	11

- a) $y = x + 14$ b) $x = y^2 + 2$ c) $y = x^2 + 2$
 d) $y = -3x + 2$ e) $y = -2x + 2$

2. Which equation could have produced the following graph?



- a) $y = 2x$ b) $y = 3x + 1$ c) $y = 2x + 3$
 d) $y = x + 3$ e) $y = 3x^2$

3. Which letter best describes the shape of the graph of the equation $y = 3x^2 + 2$?

- a) W b) V c) U d) T e) S

(9)F&R-3 The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by describing in words how a change in one variable in a formula affects the remaining variables (e.g., how changing the radius affects the volume of a cylinder).

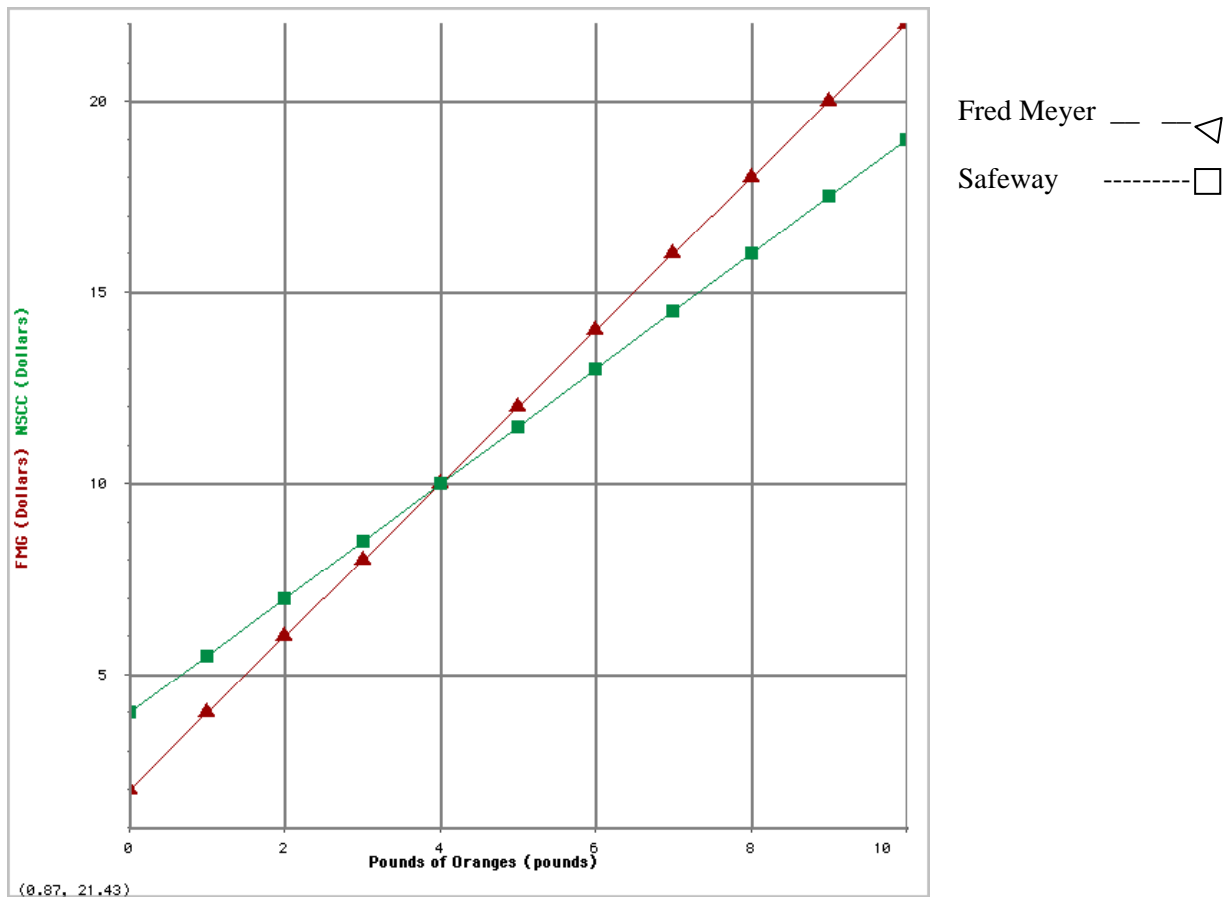
1. Describe what happens to the area of a circle when the radius is doubled.
Use the formula : $A = \pi r^2$

2. Describe what happens to the volume of a sphere when the radius is increased from 2cm to 3cm. Use the formula: $V = \frac{4}{3} \pi r^3$

3. Describe what happens to the area of a square when the side length is reduced from 6 to 3.

(9)F&R-5 The student demonstrates algebraic thinking by modeling (graphically or algebraically) or solving situations (including real-world applications) using systems of linear equations.

1. Super Dad is comparing prices of fruit at two local grocery stores. He is also aware that the cost to drive to each store varies significantly. Fred Meyer's Grocery sells oranges for \$2.00 per pound and it costs \$2 to get there. Safeway sells oranges for \$1.50 per pound but it is farther and it costs \$4 to get there. The graph below shows this relationship.



When comparing costs, which statement is true?

- a) Fred Meyer's is always a better deal
- b) Safeway is always a better deal
- c) Fred Meyer is a better deal if Super Dad buys less than 4 pounds of oranges
- d) Safeway is a better deal if Super Dad buys less than 4 pounds of oranges
- e) None of the above is true.

(9)F&R-5 The student demonstrates algebraic thinking by modeling (graphically or algebraically) or solving situations (including real-world applications) using systems of linear equations.

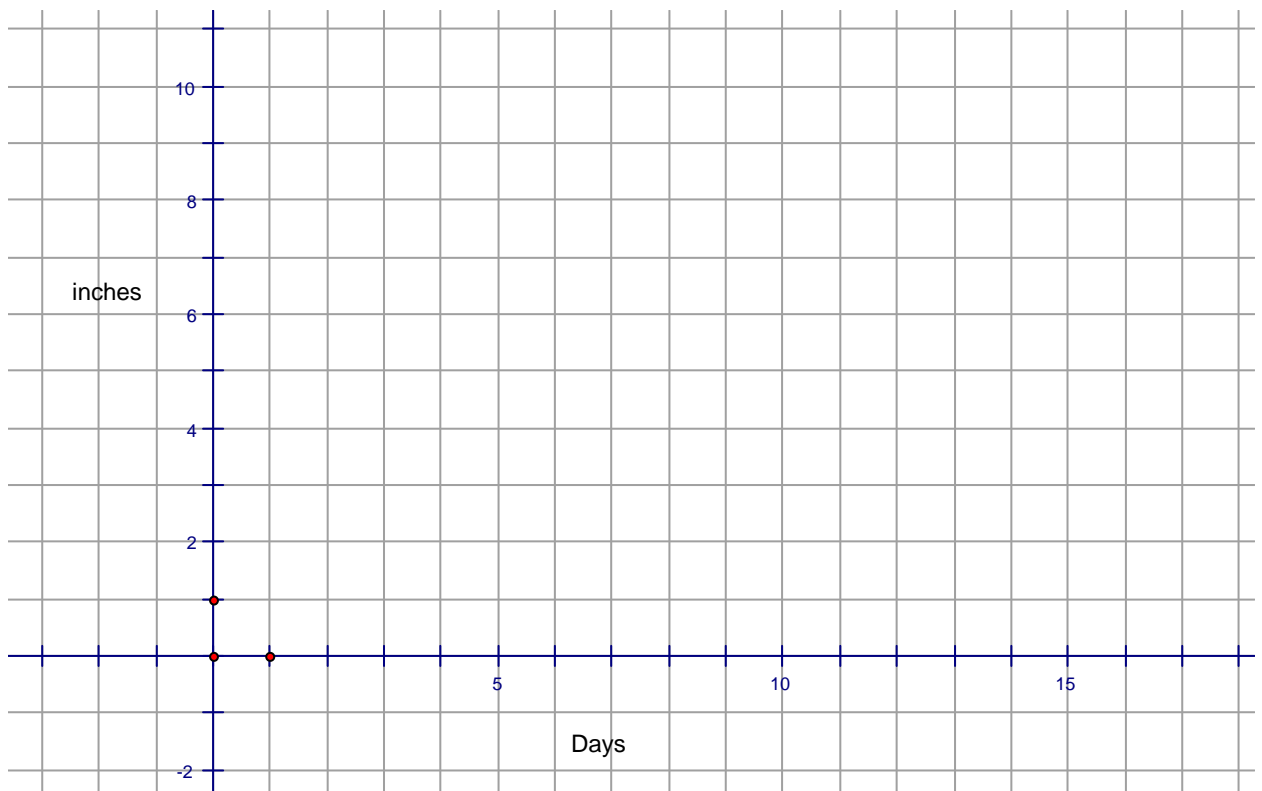
2. Gwynn germinates flowers in her greenhouse and then plants them in her garden each Saturday in June. The blue flowers grow at one inch per day and the red flowers grow at half an inch per day. Gwynn planted the red flowers one week before she planted the blue flowers.

Let x be the number of days the blue flowers are planted.

Write a system of equations showing the height of each type of flower.

Graph the system.

Use your graph to find when the flowers will be the same height.



3. Clothes R Us is having a yearly sale. Every pair of pants costs the same and every shirt costs the same, but shirts and pants do not cost the same. Two shirts and one pair of pants cost Allen \$55. One shirt and two pairs of pants cost \$65. What is the total cost for one shirt and one pair of pants?

(9)F&R-6 The student demonstrates algebraic thinking by solving multi-step linear equations of the form $ax \pm b = cx \pm d$, where a, b, c and d are rational numbers and $a \neq 0, c \neq 0$.

Solve the following equations for x :

1. $3x + 4 = 2x - 5$

2. $\frac{2}{3}x - 1 = \frac{1}{3}x + 2$

3. $14x + 5 = 5x + 4$

(9)F&R-7 The student demonstrates algebraic thinking by solving literal equations or formulas for a variable involving one step (e.g. solve for t when $d=rt$).

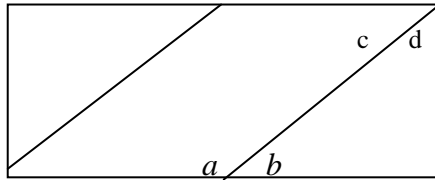
1. Given the formula $d = rt$ to describe the relationship between distance, rate and time, solve for t .

2. Given the Ideal Gas Law, $PV = nRT$, describing the behavior of gases, solve for temperature, T .

3. According to Newton's Second Law, $F = ma$, the force an object exerts, F , is equal to the mass, m , of that object multiplied by its acceleration, a . Solve for m .

(9)G-1 The student demonstrates an understanding of geometric relationships by identifying, analyzing, comparing, or using properties of angles (including supplementary and complementary) or circles (degrees in a circle).

The picture below shows the rectangular company logo that Seth designed on a computer.

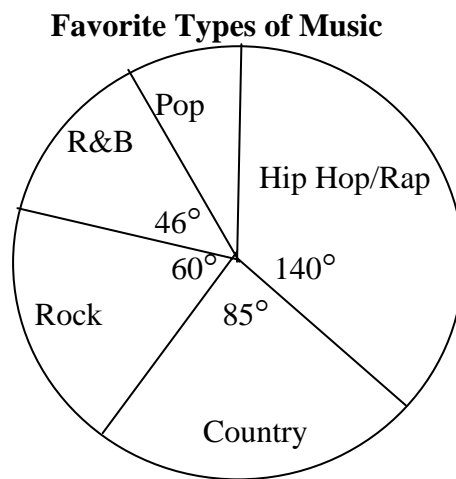


1. Angle a is 135° . Which statement about angles a and b is true?
 - a.) a and b are supplementary angles.
 - b.) a and b are congruent angles.
 - c.) a and b are complementary angles.
 - d.) a and b are right angles.

Using Seth's logo from above, answer True or False for each of the following:

2. Angle a is congruent to angle d .
3. Angle a and angle c are supplementary.
4. Angle c and angle d are complementary.

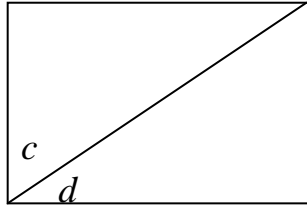
The circle graph below represents favorite types of music of the freshman class.



5. How many degrees is the central angle of the Pop section? Show all your work or explain your thinking even if you use mental math.

(9)G-1 The student demonstrates an understanding of geometric relationships by identifying, analyzing, comparing, or using properties of angles (including supplementary and complementary) or circles (degrees in a circle).

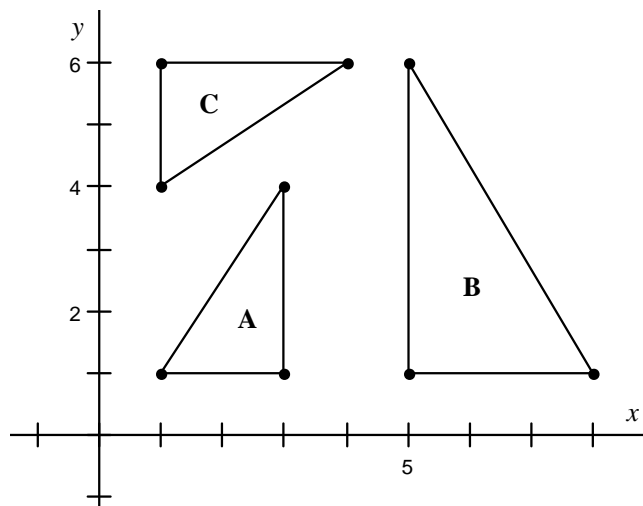
The picture below shows a rectangular tile design.



6. Angle d is 42° . Which statement about angles c and d is true?
- a.) They are supplementary and angle c is 48° .
 - b.) They are supplementary and angle c is 138° .
 - c.) They are complementary and angle c is 48° .
 - d.) They are complementary and angle c is 138° .

(9)G-2 The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by using a coordinate plane to solve problems involving congruent or similar shapes.

Three triangles are graphed on the coordinate plane.

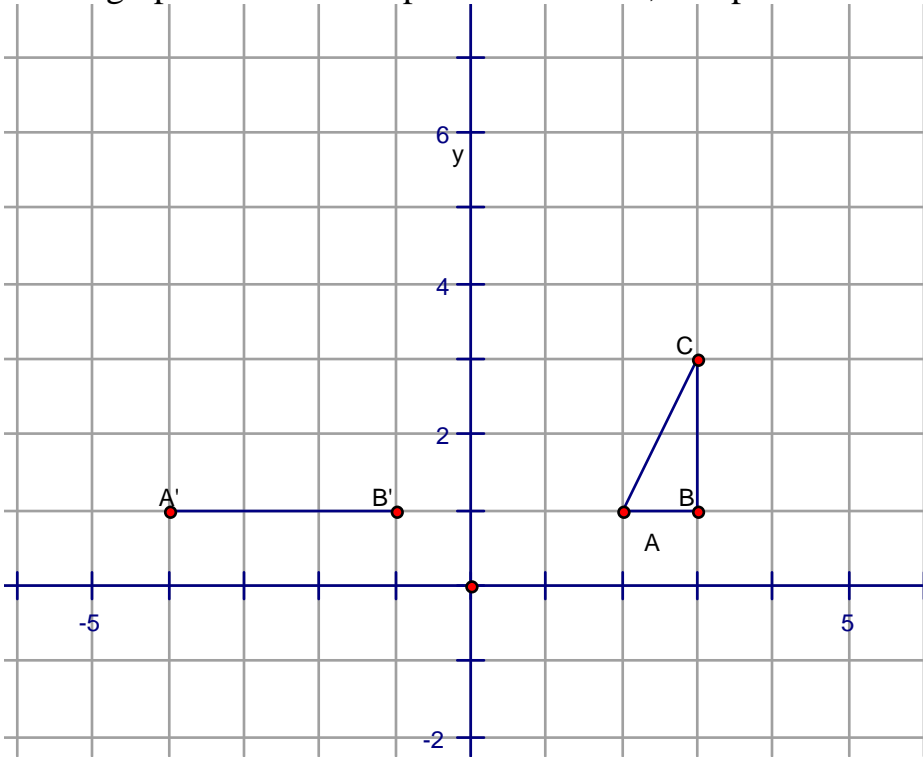


1. Which statement about triangles A, B, and C is true?
 - a.) Triangles A and B are congruent.
 - b.) Triangles A and C are congruent.
 - c.) Triangles B and C are congruent.
 - d.) None of the triangles are congruent.

2. Is triangle A similar to triangle B?
Justify your answer.

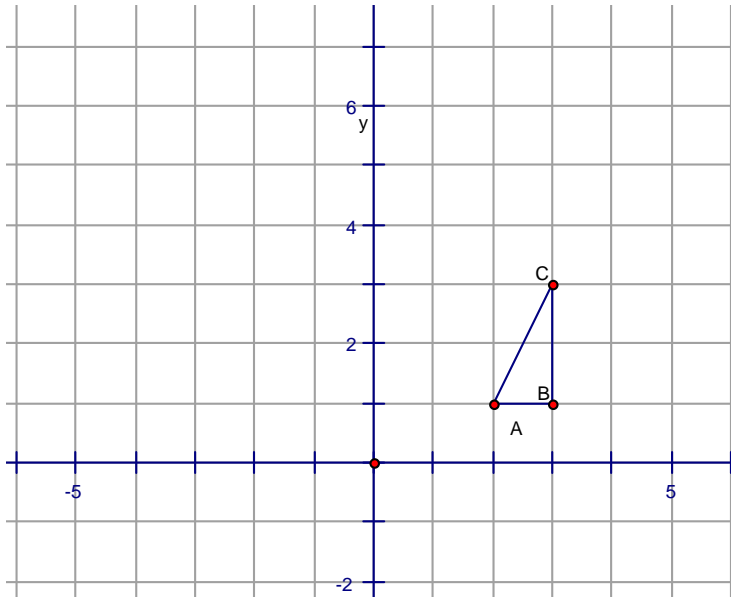
(9)G-2 The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by using a coordinate plane to solve problems involving congruent or similar shapes.

Gina has graphed $\triangle ABC$ and points A' and B' , two points in another triangle.



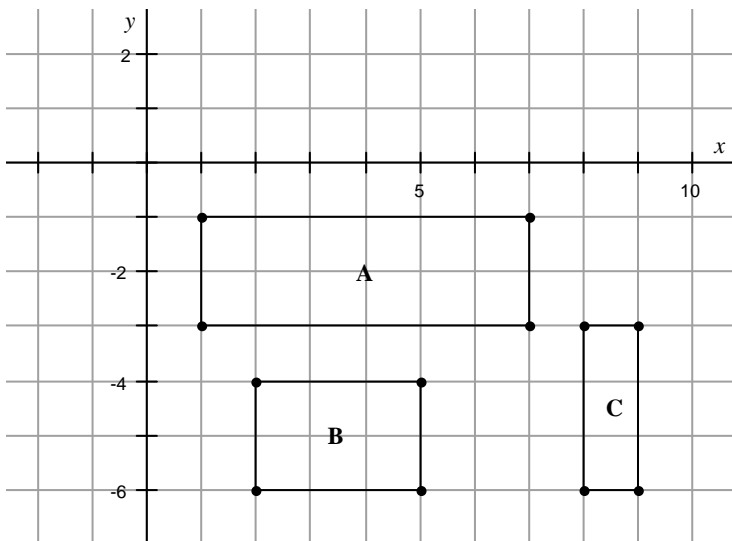
3. Gina wants the two triangles to be similar. Which ordered pair should be C' to complete the second triangle?

- a.) $(-4, 2)$
- b.) $(-1, 3)$
- c.) $(-4, 3)$
- d.) $(-1, 7)$



4. Draw the reflection of triangle ABC over the y-axis. Label the reflected points A', B', C'.

Three rectangles are graphed on the coordinate plane.



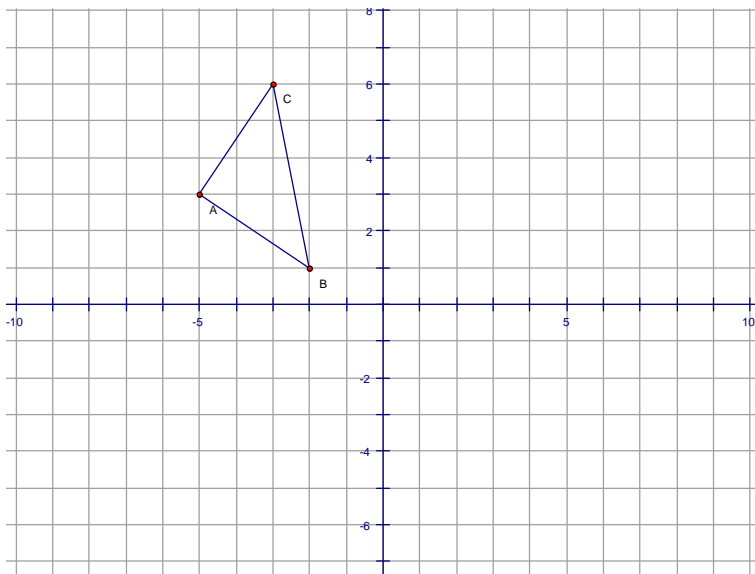
5. Which statement about rectangles A, B, and C is true?
- Rectangles A and B are congruent.
 - Rectangles A and B are similar.
 - Rectangles A and C are similar.
 - Rectangles B and C are congruent.

(9) G-3 The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by [drawing or describing the results of applying transformations (translations, rotations, reflections, or dilations) to figures on a coordinate plane L]

1. In a rectangular coordinate system, the coordinates of point A are (-3, 5). Point A moves 7 units to the right and 10 units down. Find the new coordinates of point A.

- a.) (-10, 15) b.) (-10, -5) c.) (4, 15) d.) (4, -5)

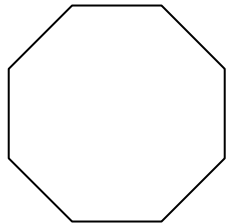
2. Reflect $\triangle ABC$ over the x-axis and label it $\triangle A'B'C'$.



3. $\triangle ABC$ and $\triangle A'B'C'$ in problem #2 are _____.

- a.) similar triangles. b.) congruent triangles
c.) isosceles triangles d.) equilateral triangles

4. Draw all lines of symmetry in the figure below.



(9)G-4 The student solves problems (including real-world situations) by determining the volume or surface area of prisms, cylinders, cones or pyramids.

1. A square pyramid has a base area of 9 square feet and a height of 7 feet. Using the formula below, find the volume of the pyramid.

$$V = \frac{1}{3}lwh, \text{ where}$$

$l = \text{length}$
 $w = \text{width}$
 $h = \text{height}$

- a.) 21 cubic feet
b.) 27 cubic feet
c.) 63 cubic feet
d.) 189 cubic feet

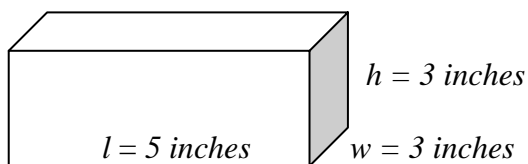
2. A cylinder is 10 meters in height. Its base has a radius of 2 meters. Using the formula below, find the volume of the cylinder. Use 3.14 for π .

$$V = \pi r^2 h, \text{ where}$$

$r = \text{radius}$
 $h = \text{height of cylinder}$

- a.) 12.56 cubic meters
b.) 31.4 cubic meters
c.) 62.8 cubic meters
d.) 125.6 cubic meters

3. Damian wants to cover a box with wrapping paper. Determine exactly how much paper will he need to cover the box below by finding the surface area. Show all your work.

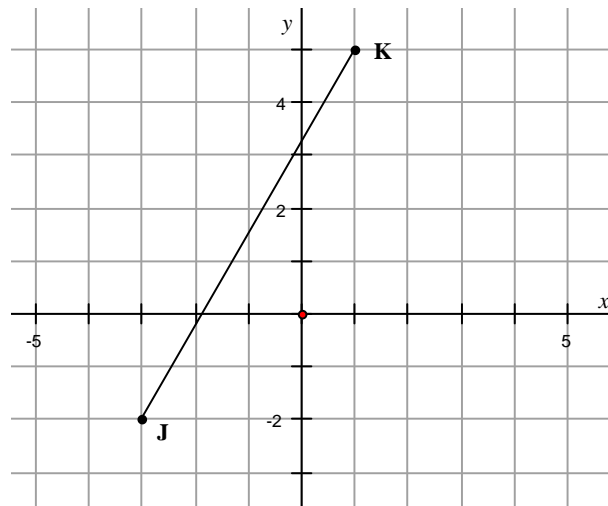


$$\text{S.A.} = 2(lw) + 2(hw) + 2(lh)$$

S.A. = surface area
 $l = \text{length}$
 $w = \text{width}$
 $h = \text{height}$

(9)G-5 the student demonstrates understanding of position and direction when solving problems (including real-world situations) by graphing (using equations or formulas to determine the slope of line segments on a coordinate plane).

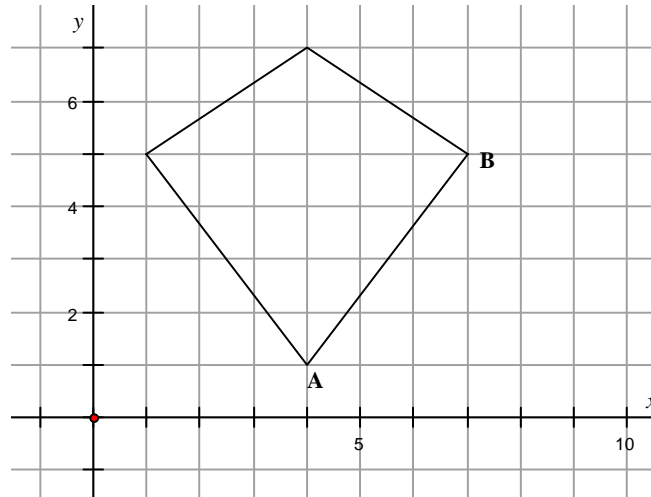
1. Find the slope of line segment JK.



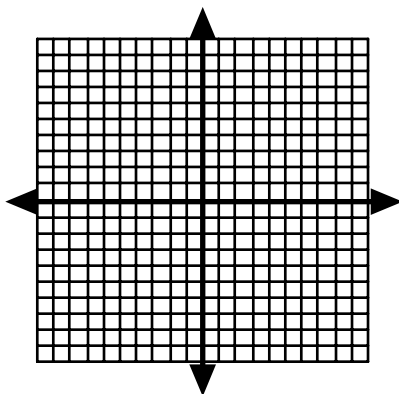
- a.) $\frac{4}{7}$
- b.) $\frac{7}{3}$
- c.) $\frac{7}{4}$
- d.) $\frac{2}{7}$

(9)G-5 the student demonstrates understanding of position and direction when solving problems (including real-world situations) by graphing (using equations or formulas to determine the slope of line segments on a coordinate plane).

Jennifer is using this pattern to design a kite.



2. Give the coordinates of vertex A and vertex B.
3. Give the formula for finding the slope of a line given two ordered pairs.
4. Using your answers from questions 2 and 3, find the slope of line segment AB in Jennifer's pattern.
 - a.) $\frac{3}{4}$
 - b.) $\frac{2}{3}$
 - c.) $\frac{7}{5}$
 - d.) $\frac{4}{3}$
5. Plot point B, (1, 4) and point C (5, 2).
Find the slope of line segment BC.
Show all your work or explain your thinking.

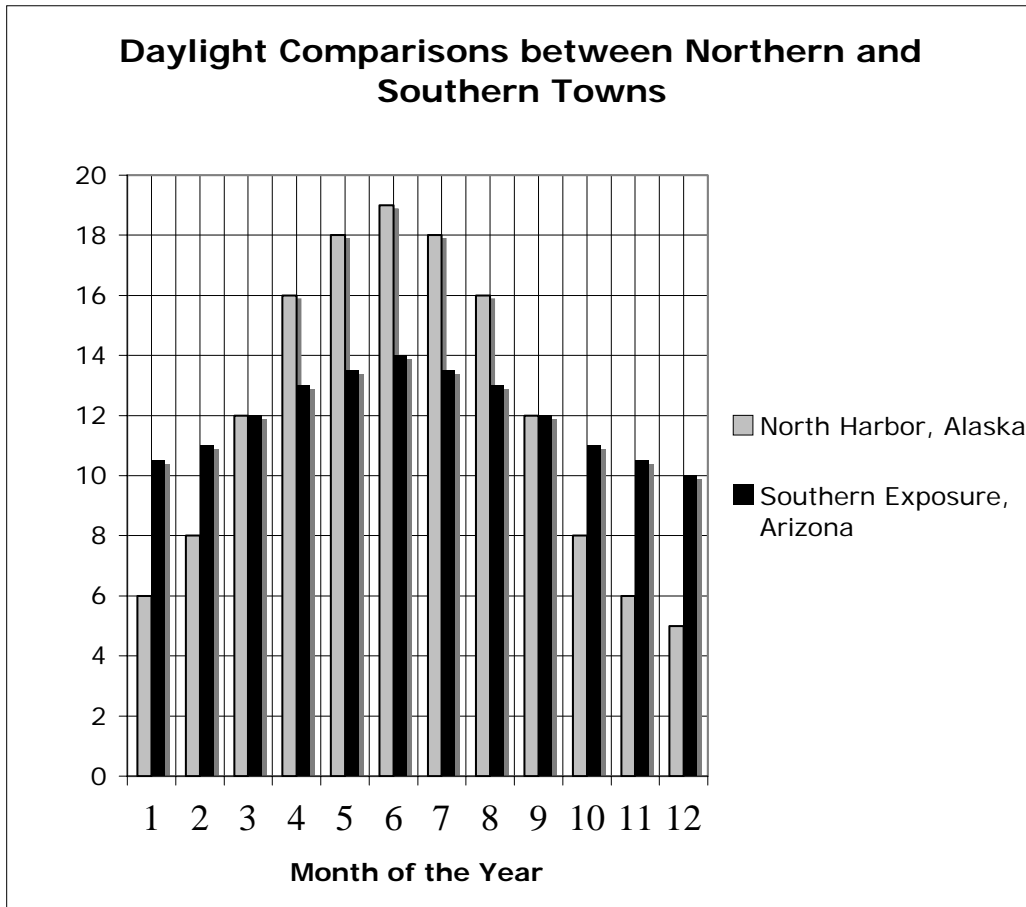


(9)G-5 the student demonstrates understanding of position and direction when solving problems (including real-world situations) by graphing (using equations or formulas to determine the slope of line segments on a coordinate plane).

6. Given $y = \frac{1}{3}x - 4$, tell which of the following is true about points on the line:
- a.) When y moves 3 units up, x moves 1 unit to the right.
 - b.) When y moves 3 units up, x moves 1 unit to the left.
 - c.) When y moves 1 unit up, x moves 3 units to the right.
 - d.) When y moves 1 unit up, x moves 3 units to the left.

(9)S&P-1 The student demonstrates an ability to classify or organize data by organizing, displaying, or explaining the classification of data in real-world patterns (e.g., science or humanities, peers, community, or careers) using information from tables or graphs that display two sets of data.

Xavier was doing a bit of research on Seasonal Affective Disorder when he found this chart relating to daylight.



1. In North Harbor, which month is there most likely an increased incidence of Seasonal Affective Disorder (which month has the least hours of daylight)?
 a) Month 6 b) Month 10 c) Month 1 d) Month 12 e) Month 2
2. How many hours of daylight are there in North Harbor in the 2nd month ?
 a) 8 b) 9 c) 10 d) 11 e) 12
3. During which months are the daylight hours in North Harbor and Southern Exposure the same?
 a) months 1 & 11 b) months 2 & 10 c) months 3 & 9
 d) months 5 & 7 e) they are never the same

(9)S&P-2 The student demonstrates an ability to analyze data (comparing, interpreting, evaluating, making predictions, or, describing trends; or drawing, formuating, or justifying conclusions) by using information from a variety of displays or analyzing the validity of statistical conclusions found in the media.

Kayla was researching the amount of caffeine in popular soft drinks. She found this stem and leaf plot.

Caffeine Content (mg) per 8-ounce Serving of Various Soft Drinks

1	5 5 6
2	0 3 3 6 7 7 8 8 8 9
3	1 3 5 5 7 7 8
4	3 3 7 7

Key:

3|5 means 35 mg

1. Kayla wanted to find the maximum caffeine found in a soft drink. What is the maximum caffeine content from the stem and leaf plot?

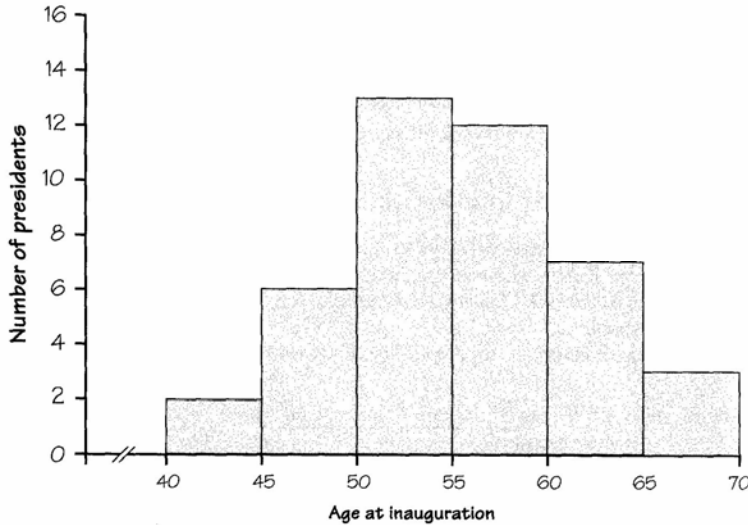
- a.) 23
- b.) 33
- c.) 47
- d.) 94

2. What is the mode of the caffeine content?

- a.) 15
- b.) 28
- c.) 37
- d.) 43

(9)S&P-2 The student demonstrates an ability to analyze data (comparing, interpreting, evaluating, making predictions, or, describing trends; or drawing, formulating, or justifying conclusions) by using information from a variety of displays or analyzing the validity of statistical conclusions found in the media.

Mai was doing a research paper on presidents' ages. She found this histogram.



3. How many presidents were 45 years old or older when they were inaugurated?
 a.) 2 b.) 6 c.) 33 d.) 41

The table below shows the fuel economy (in miles per gallon) of several motor vehicles.

	Vehicle Type	Transmission Type	City MPG	Highway MPG
Car A	Subcompact	Automatic	22	31
Car B	Subcompact	Manual	23	32
Car C	Midsize	Automatic	20	29
Car D	Four-wheel drive	Automatic	16	20

4. Which car or cars get more than 20 miles per gallon for *both* the city and highway?
 a.) Car A
 b.) Car A and car B
 c.) Car C and car D
 d.) Car A, car B, and car C

(9)S&P-3 The student demonstrates an ability to analyze data (comparing, interpreting, evaluating, making predictions, or, describing trends; or drawing, formulating, or justifying conclusions) by using range and measures of central tendency to determine the best representation of the data for a practical situation.

1. A computer company tested the speed of its new computer. The testing obtained a mean of 1.72 MHz, a median of 1.76 MHz and a mode of 1.68 MHz. Which measure of central tendency, the mean, the median, or the mode should the company use to best advertise its new computer?
 - a.) Mean
 - b.) Median
 - c.) Mode
 - d.) They are all the same so it does not matter which they report.

A consumer testing service obtained the following miles per gallon in five test runs performed with two compacted cars:

Car A: 27.9, 30.4, 30.6, 34.2, 30.8

Car B: 31.2, 28.7, 31.3, 28.7, 31.3

2. Find the range, mean, median, and mode and range for both Car A and Car B. Show all of your work. Put your answers in the table below.

	Mean	Median	Mode	Range
Car A				
Car B				

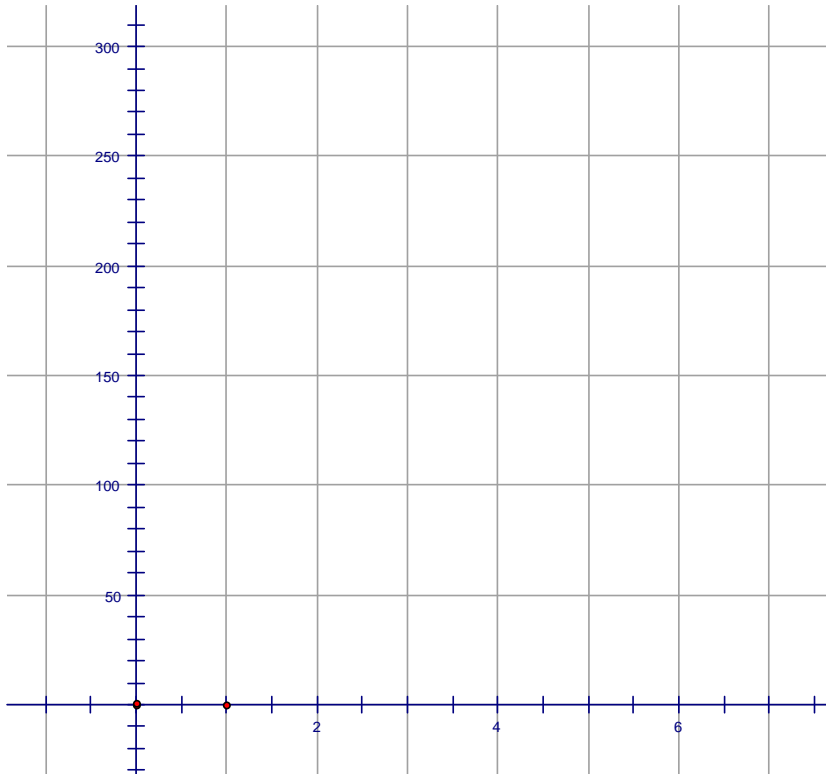
3. If the manufacturers of Car A wanted to advertise that their car performed best in this test, should they use the mean or the median? Explain your thinking.

(9)S&P-4 The student demonstrates a conceptual understanding of probability and counting techniques by identifying and showing the meaning of best-fit line.

Ronnie is driving north to Fairbanks. The table below gives the distance Ronnie has traveled after each hour.

Hours	Miles Traveled
1	40
2	90
3	140
4	190
5	240

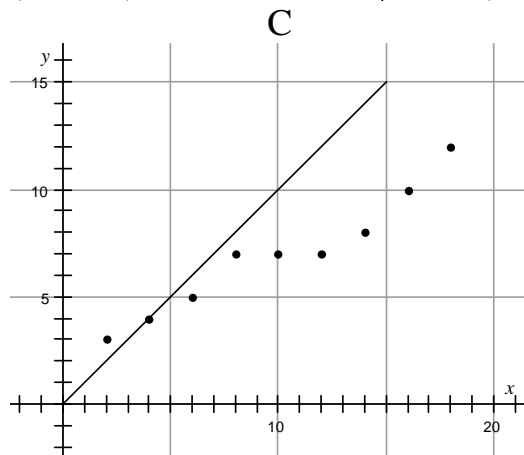
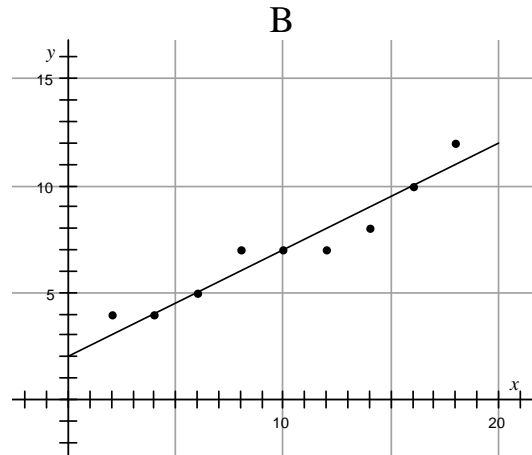
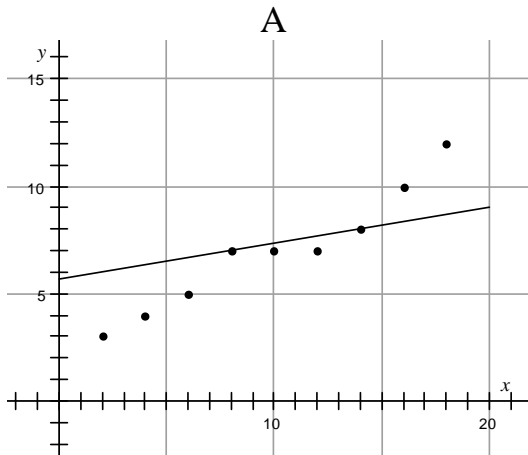
1. Create a scatter plot of the data using the x -axis for the time and the y -axis for the distance traveled.



2. Using the table and the scatter plot, estimate the number of miles Ronnie will have traveled after 7 hours. Show your work or explain your thinking even if you use mental math.

(9)S&P-4 The student demonstrates a conceptual understanding of probability and counting techniques by identifying and showing the meaning of best fit line.

3. Which of the following is the best fit line for the given scatter plot? _____



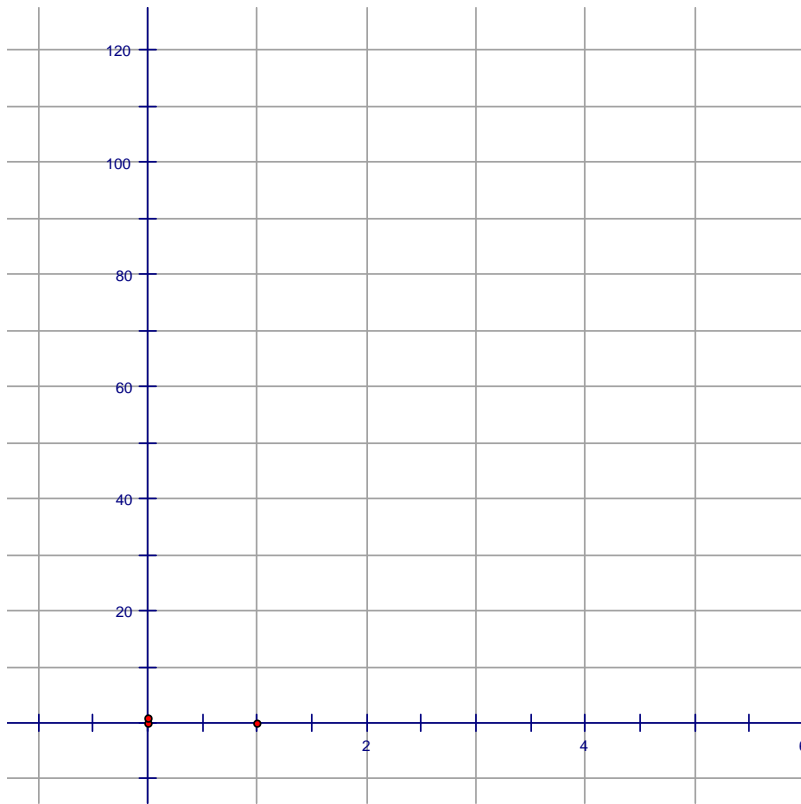
Explain your choice. _____

(9)S&P-4 The student demonstrates a conceptual understanding of probability and counting techniques by identifying and showing the meaning of best fit line.

A large tank is being filled with water. The table below gives the volume of water after each hour.

Hours	Gallons of water
1	25
2	45
3	67
4	85
5	105

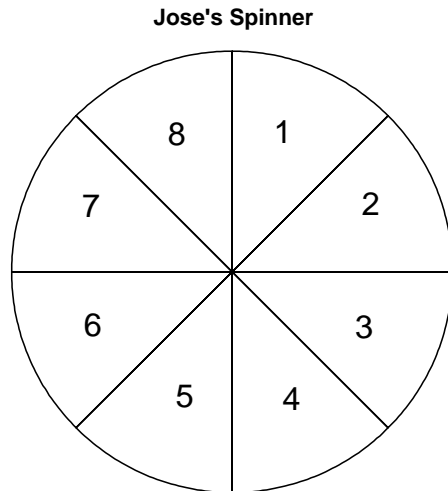
4. Create a scatter plot of the data using the x -axis for the time and the y -axis for the gallons of water.



5. Using the table and the scatter plot, estimate the number of gallons the tank will contain after 8 hours. Show your work or explain your thinking even if you use mental math.

(9)S&P-5 The student demonstrates a conceptual understanding of probability and counting techniques by making predictions about the probability of independent or dependent events and using the information to solve problems.

Jose spins the spinner below.



1. What is the probability of landing on either a 3 or a 6?
a.) $\frac{1}{4}$ b.) $\frac{1}{8}$ c.) $\frac{1}{3}$ d.) $\frac{2}{3}$

All the possible outcomes of flipping two coins are listed below.

H, H	H = heads
H, T	T = tails
T, H	
T, T	

2. Marco flips 2 coins, What is the probability that both coins are tails?
a.) $\frac{1}{4}$ b.) $\frac{1}{2}$ c.) $\frac{1}{8}$ d.) $\frac{3}{8}$

From a standard 52-card deck, Paula draws a card. It is an ace. Without replacing it, she decides to draw another card.

3. What is the probability that the second card will also be an ace?
a.) $\frac{2}{4}$ b.) $\frac{4}{52}$ c.) $\frac{3}{52}$ d.) $\frac{3}{51}$

(9)S&P-6 The student demonstrates a conceptual understanding of probability and counting techniques by designing, conducting, analyzing, and communicating the results of a probability experiment.

1. A manufacturing company making Ulu knives tests 50 knives and finds that 3 are defective. They plan to make 300 more knives. About how many of the 300 knives should they expect to be defective?

- a.) 9
- b.) 15
- c.) 18
- d.) 24

Marlene drew socks at random from a drawer for a probability experiment and returned the sock to the drawer after each draw. The table below shows her results.

Marlene's First 10 Draws

Draw	1	2	3	4	5	6	7	8	9	10
Color	black	blue	black	white	blue	blue	black	black	black	white

2. Marlene plans to make an additional 20 draws. How many black socks should she expect to draw from these 20 draws?

- a.) 10
- b.) 15
- c.) 20
- d.) 100

3. In a random sample of 50 students from a local high school, 15 of the students are freshman, 12 are sophomores, 12 are juniors and 11 are seniors. Based on this study, give an estimate of the percentage of freshman students at this school.

- a.) 15%
- b.) 24%
- c.) 25%
- d.) 30%