

Countdown to the STAAR Algebra I EOC

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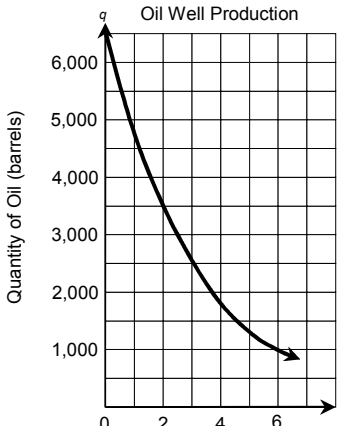
Algebra I Sample Page:

1 The time required to empty a tank, y , varies inversely with the rate of pumping, x . If a pump can empty a tank in 45 minutes at a rate of 200 gallons per minute, how long will it take to empty the tank at a pump rate of 450 gallons per minute?

(A) 10 minutes (C) 20 minutes
(B) 18 minutes (D) 35 minutes

5.A.11.B

3 The graph shows the relationship between the production rate of a particular oil well after it has reached its peak production rate and the time in years the well is kept in production.



Oil Well Production

Quantity of Oil (barrels)

Time (years)

Looking at the graph, which statement appears to be most correct?

(A) The well's production rate decreased by 1,500 barrels per year.
(B) The well's production rate decreased by 500 barrels per year.
(C) The well's production rate decreased more from Year 0 to Year 1 than in any other year.
(D) The well's production rate decreased more from Year 5 to Year 6 than in any other year.

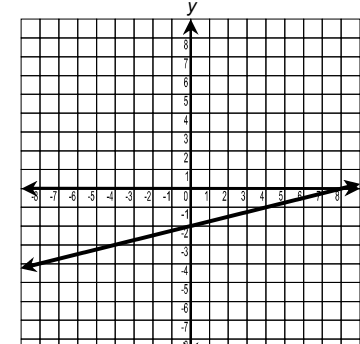
1.A.1.E

4 The Sleep Accessories Store sold a total of 316 large and small pillows last month. The total sale value of these pillows was \$5,359. Large pillows sold for \$22.50 each and small pillows sold for \$14 each. Which of these systems of linear equations could be used to find l , the number of large pillows, and s , the number of small pillows sold?

(A) $l + s = 5359$
 $22.50l + 14s = 316$
(B) $l + s = 316$
 $14l + 22.50s = 5359$
(C) $14l + 22.50s = 316$
 $l + s = 5359$
(D) $l + s = 316$
 $22.50l + 14s = 5359$

4.A.8.A

2 A linear function is graphed below.

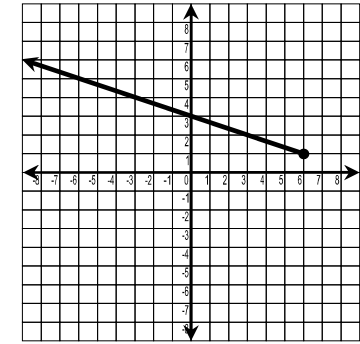


If this line is translated 5 units up, the resulting new line would best be described by which of these equations?

(A) $y = \frac{1}{4}x + 3$ (C) $y = \frac{1}{4}x - 7$
(B) $y = 4x + 3$ (D) $y = 4x - 7$

3.A.6.C

5 Which of these inequalities best represent the range of the graphed function?



(A) $y \leq 6$ (B) $y \geq 1$ (C) $y \geq 6$ (D) $y \leq 1$

2.A.2.B

Easy to implement
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Each series resembles a full-length STAAR Algebra EOC (54 problems). You can print an entire test on just 5 pages when printed front to back!

Implementation Steps

Work 1 or 2 pages a day as homework or in class as a daily warm-up.

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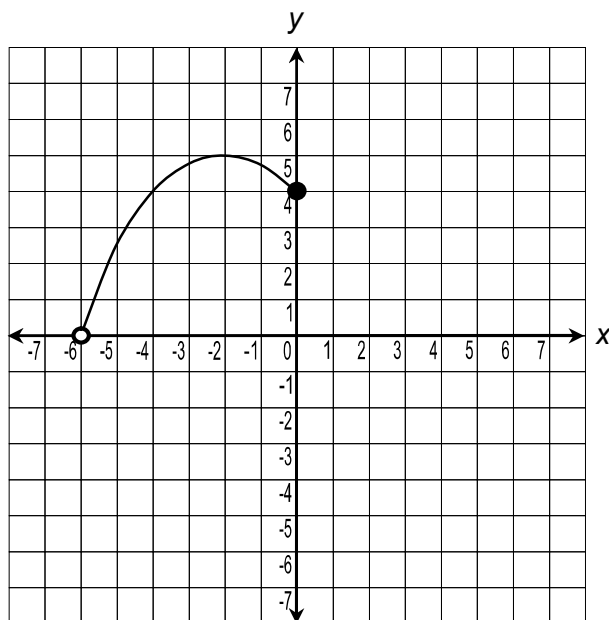
The problems on the *Countdown* are exit-level difficulty. We recommend beginning 10 weeks before the test. You can always *double up* if needed.

Maximize Effectiveness!

Check every page with your students, as a class or individually. Then identify problem areas by utilizing the provided *Quick Track* forms.

Countdown is used in over 700 Texas school districts. Make 2012 the year that your school tries this unique approach!

- 1 Which of these inequalities represent the domain of the graphed function?



- (A) $0 < y \leq 5$ (C) $-2 < y < 5$
(B) $-6 < x \leq 0$ (D) $-6 < x \leq 4$

2.A.2.B

- 2 Craig's Computer Supply Store sells color ink printer cartridges for \$24.99 and black ink printer cartridges for \$14.99. Last week the store sold a total of 27 ink cartridges. If the sales income for these items was \$514.73, not including tax, which of these conclusions is reasonable?

- (A) There were more black ink cartridges than color ink cartridges sold last week.
(B) There were more color ink cartridges than black ink cartridges sold last week.
(C) The total sales income, not including tax, for color ink cartridges was \$399.84.
(D) The total sales income, not including tax, for black ink cartridges was \$164.89.

4.A.8.C

- 3 The relationship between C , the temperature in degrees Celsius, and F , the temperature in degrees Fahrenheit, is represented by the equation $C = \frac{5}{9}(F - 32)$. If the temperature is 20°C , what is the temperature in degrees Fahrenheit?

Open/Gridded Response

4.A.7.B

- 4 Two quantities, x and y , have a relationship where y varies directly with x . The graph of this function contains the point $(-10, 6)$. Which of the following represents this relationship?

- (A) $y = \frac{3}{5}x$ (C) $y = -\frac{3}{5}x$
(B) $y = \frac{5}{3}x$ (D) $y = -\frac{5}{3}x$

3.A.6.G

- 5 The standard atmospheric temperature is dependent on the altitude above mean sea level. The approximate relationship is shown in the table.

Altitude Above Mean Sea Level (feet)	Temperature (degrees Celsius)
3000	- 4.5
4000	- 11.0
6000	- 24.0
7000	- 30.5

What would be a reasonable standard atmospheric temperature to expect at 10,000 feet above mean sea level?

- (A) $- 35.0^\circ\text{C}$ (C) $- 43.6^\circ\text{C}$
(B) $- 37.0^\circ\text{C}$ (D) $- 50.0^\circ\text{C}$

2.A.2.D

- 6 Which of these relations represent a function?

- I. $\{(0, 0), (1, 3), (3, 3)\}$
II. $\{(0, 0), (2, 2), (4, 8)\}$
III. $\{(0, 0), (3, 1), (3, 3)\}$
IV. $\{(0, 0), (0, 2), (0, 4)\}$

- (A) I and II only (C) I, II, and IV only
(B) II and III only (D) III and IV only

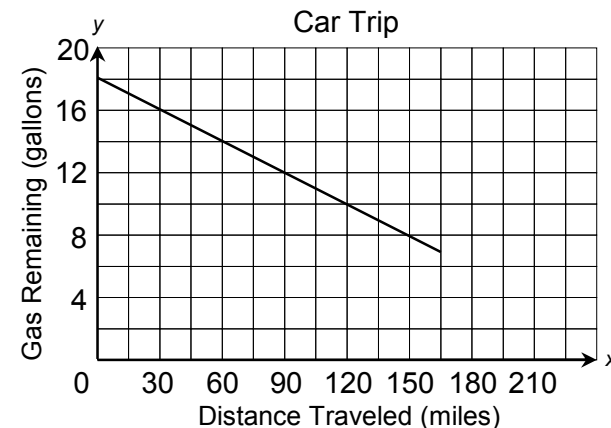
1.A.1.B

- 7 A population of 400 sea otters decreases by 2.5% per year. At the end of 7 years, there will be about 335. Which of these functions can be used to determine the number of sea otters, y , in this population at the end of t years?

- (A) $y = 400(2.5)^t$ (C) $y = 400(0.025)^t$
(B) $y = 400(1 + 0.025)^t$ (D) $y = 400(1 - 0.025)^t$

5.A.11.C

- 8 The relationship between the amount of gas remaining in a car's tank and the miles driven for a given trip are modeled on the graph below.

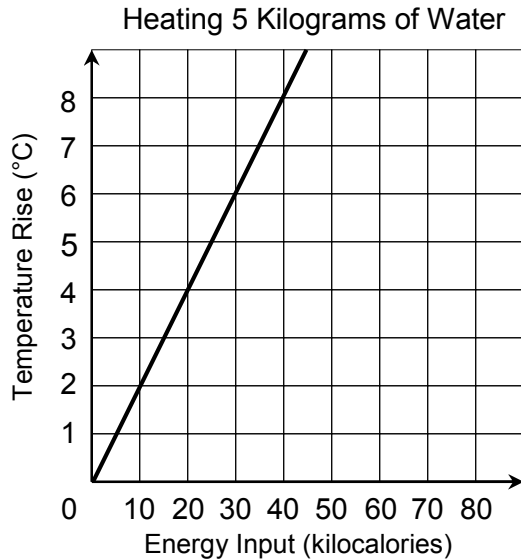


Which of these best represents the range of the graphed function for the car trip?

- (A) $15 \leq x \leq 165$ (C) $7 \leq y \leq 18$
(B) $0 \leq x \leq 250$ (D) $0 \leq y \leq 18$

3.A.5.B

- 1 The graph shows the amount of heat energy required to raise the temperature of 5 kilograms of water by various temperature amounts.



Which of the following best represents the difference between the amount of heat energy in kilocalories needed to raise the temperature of 5 kilograms of water by 8°C (degrees Celsius) and the amount needed to raise the temperature by only 4°C?

- (A) 40 (B) 20 (C) 12 (D) 4

2.A.4.A

- 2 The tables show the average amount of pounds of a salt and sand deicing mixture a city truck can spread on icy roads over time. Which table best represents a linear function?

(A)

Time (hours)	Number of pounds
1	450
2	900
3	1450
4	2000

(B)

Time (hours)	Number of pounds
1	525
2	1050
3	1550
4	1925

(C)

Time (hours)	Number of pounds
1	475
2	950
3	1425
4	1900

(D)

Time (hours)	Number of pounds
1	425
2	875
3	1350
4	1800

3.A.5.A

- 3 Given k is not equal to 0 and $(k, 2k)$ and $(2k, 6k)$ are two points on the graph of a line, what is the slope of this line?

- (A) 4 (B) $\frac{1}{4}$ (C) $4k$ (D) Not here

3.A.6.A

- 4 The equation shown describes a relationship between x and y .

$$y = 5x + 2$$

If the value of x increases by 1, what is the corresponding increase in the value of y ?

Open/Gridded Response

1.A.1.E

- 5 Elena can assemble a bicycle in 1.25 hours and a scooter in 0.6 hours. Which of the following inequalities best represents the number of bicycles, b , and the number of scooters, s , she can assemble in one day if she works a maximum of 6 hours?

- (A) $1.25b + 0.6s \geq 6$ (C) $(1.25 + 0.6)(b + s) \geq 6$
 (B) $1.25b + 0.6s \leq 6$ (D) $(1.25 + b) + (0.6 + s) \leq 6$

4.A.7.A

- 6 A selection of values from two linear equations is shown in the tables.

x	y
-6	2
4	7
-2	4
8	9

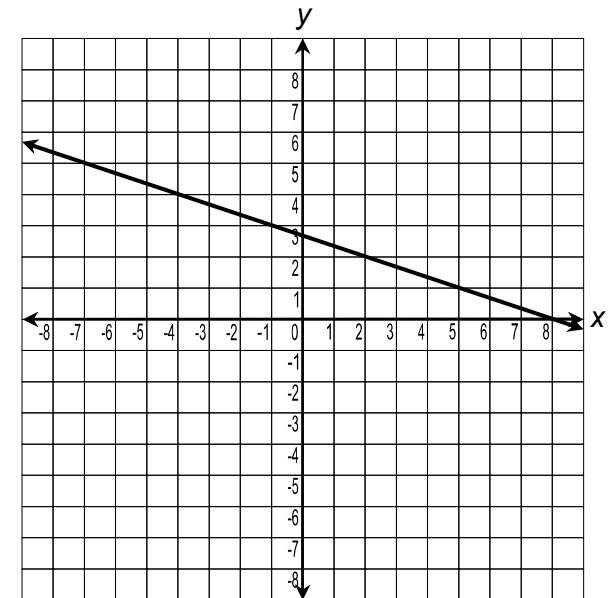
x	y
4	7
-2	-17
1	-5
0	-9

For this system of equations represented by the tables, what is the solution?

- (A) (-6, 3) (B) (1, 2) (C) (8, -9) (D) (4, 7)

4.A.8.B

- 7 The equation $x + 3y = 8$ is graphed.

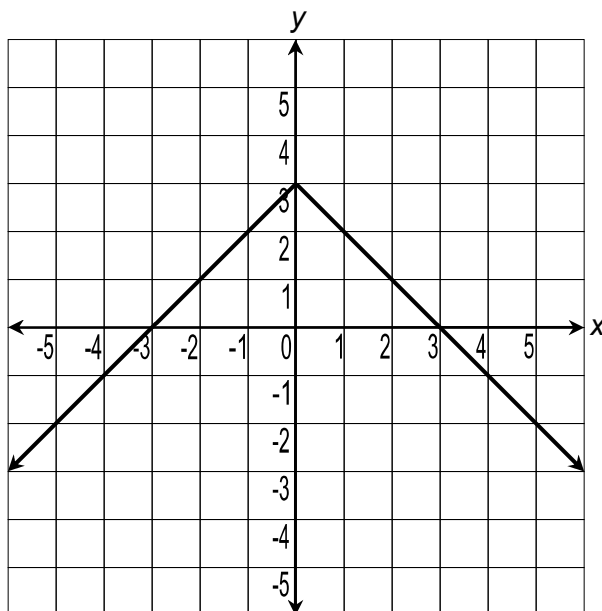


Which point represents a solution for this equation?

- (A) (6, 0) (B) (0, 2) (C) (-1, 3) (D) (3, -1)

4.A.7.B

- 1 Which of the following best describes the range of the graphed function?



- Ⓐ The range is all real numbers less than or equal to zero.
- Ⓑ The range is all real numbers.
- Ⓒ The range is all real numbers less than or equal to 3.
- Ⓓ The range is all real numbers less than or equal to -3 .

2.A.2.B

- 2 A sales manager wants to order baseball caps with her company logo for the salespeople attending an upcoming trade show. Unique Uniforms Company charges \$17.75 per cap plus a design fee of \$30. Logos Direct Inc charges \$15.50 per cap plus a delivery fee of \$48. For what number of caps ordered would the cost be the same from both vendors?

Open/Gridded Response

4.A.8.B

- 3 For the graph of $y = -3x - 5$, which of these statements is not a correct description?

- Ⓐ The graph of this function contains the points $(0, -5)$, $(-1, -2)$, and $(2, 11)$.
- Ⓑ When the value of x increases by 1 unit the value of y decreases by 3 units and the graph of this function contains the point $(-1, -2)$.
- Ⓒ The graph of this function contains the points $(-2, 1)$, $(-1, -2)$, and $(3, -14)$.
- Ⓓ The graph of this function is a line with a slope of -3 and passes through the point $(0, -5)$.

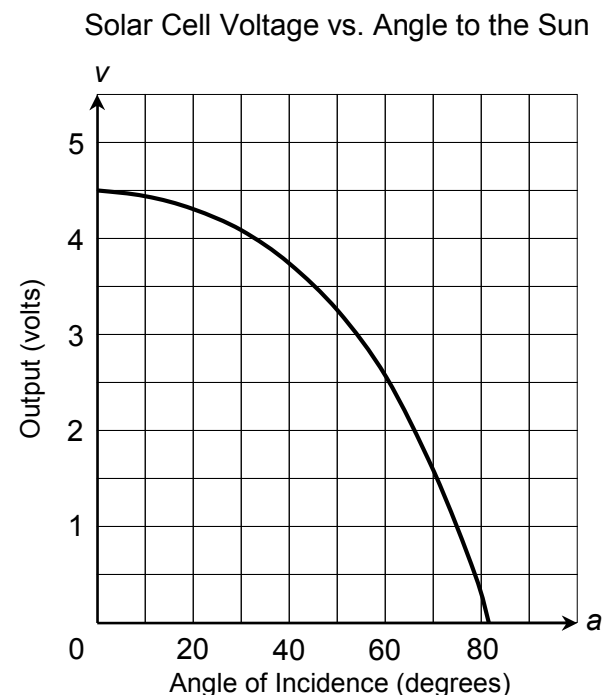
3.A.5.C

- 4 Data-Safe Company leases online data storage space. A customer can store up to 750 gigabytes of computer files for an annual fee of \$19.95. If the number of gigabytes exceeds 750, then the equation $c = 0.05(g - 750) + 19.95$ determines the annual cost, c , in dollars in terms of g , the total number of gigabytes of data stored. Which statement best describes this information?

- Ⓐ If the total number of gigabytes stored is more than 750, then every gigabyte stored costs 5 cents.
- Ⓑ If the total number of gigabytes stored exceeds 750, then each gigabyte beyond 750 costs 5 cents.
- Ⓒ The first 750 gigabytes stored costs 5 cents each, after which there is an additional cost of \$19.95.
- Ⓓ Every gigabyte of data stored costs 5 cents no matter how many gigabytes are stored.

1.A.1.E

- 5 The voltage output of a solar cell was tested at different angles of incidence to the sun. Zero degrees of incidence means the sun was directly overhead. The graph shows the change in voltage output, v , compared to the angle of incidence, a , to the sun.



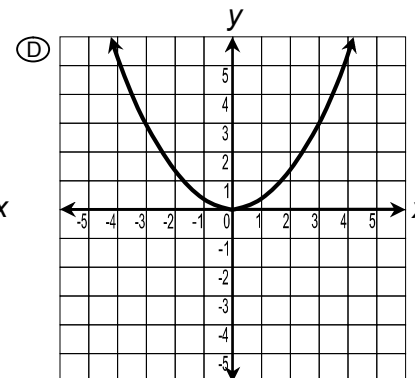
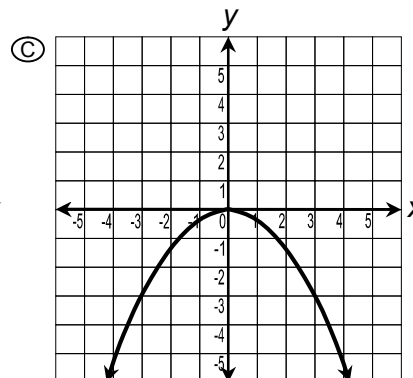
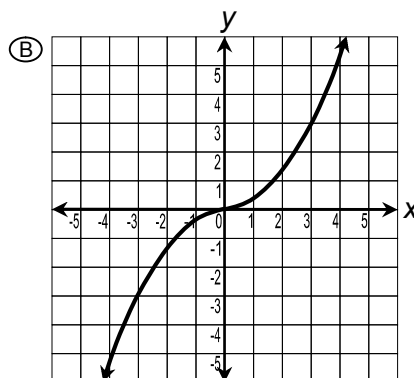
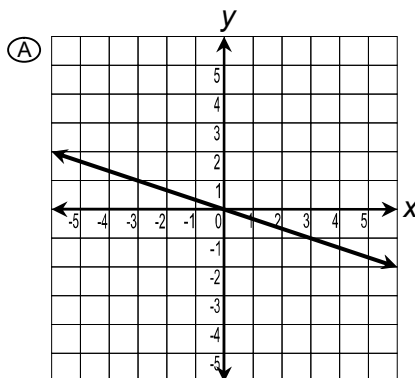
Which angle of incidence interval best represents when the solar cell's voltage output was at 3.5 volts?

- Ⓐ Between 30 degrees and 40 degrees
- Ⓑ Between 50 degrees and 60 degrees
- Ⓒ Between 70 degrees and 80 degrees
- Ⓓ Between 40 degrees and 50 degrees

5.A.9.D

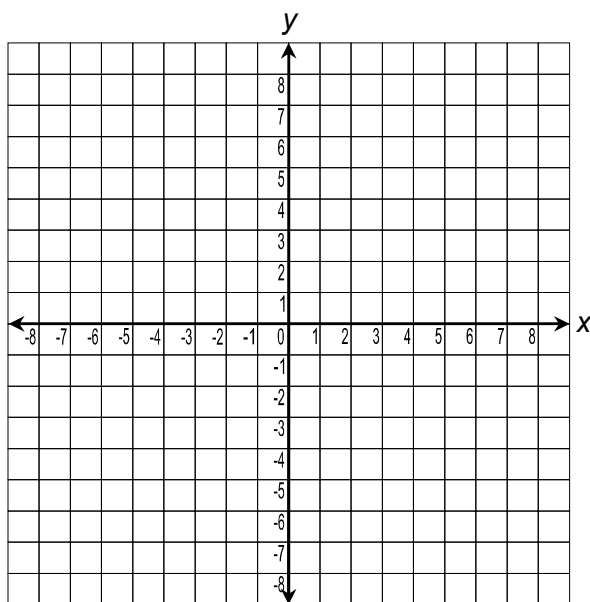
1 Which graph best represents the data set shown in the table?

x	y
-3	-3
-1	$-\frac{1}{3}$
0	0
3	-3



1.A.1.D

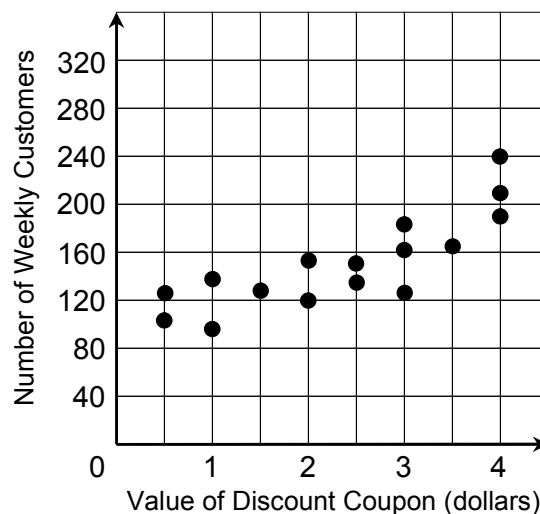
2 What is the equation of the line that has a y-intercept of (0, 4) and passes through the point (6, 1)?



- (A) $y = -\frac{1}{2}x + 4$ (C) $y = \frac{1}{2}x + 4$
 (B) $y = 6x + 4$ (D) $y = 4x + 6$

3.A.6.D

3 For the past 4 months, The Good Food Diner has kept a record of the total number of evening customers each week and the value of its dinner-time discount coupon advertised in the local newspaper.

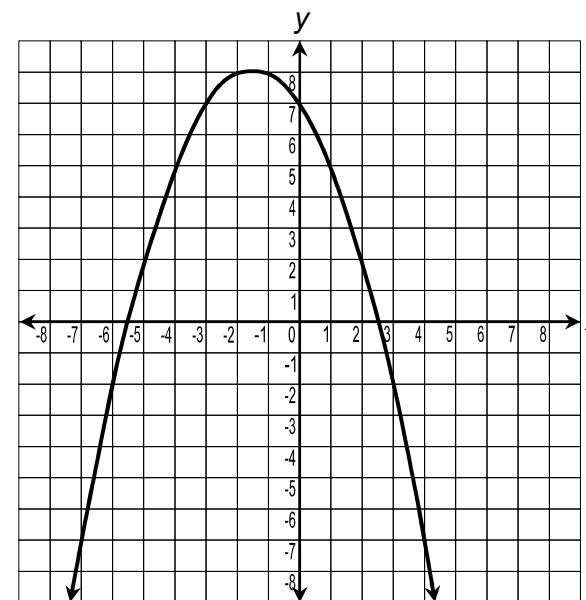


Based on the graph of this data, which is the best estimate of the number of customers the restaurant can expect if it offers a \$3.50 discount coupon?

- (A) 100 (B) 230 (C) 120 (D) 180

2.A.2.D

4 A quadratic function is graphed below.

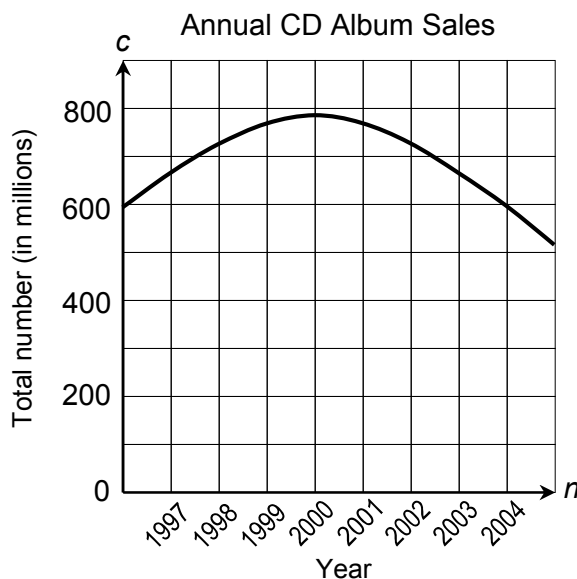


When the function equals -7, which is the best estimate of the positive value of x?

- (A) 0 (B) 4 (C) 5 (D) 8

5.A.10.A

- 1 The graph represents the approximate annual number of music CD albums sold during the years shown.



According to this graph, which of the time intervals best represents the time period when annual sales were greater than 700 million per year?

- (A) Earlier than 1997
(B) Between 1996 and 2004
(C) Between 1998 and 2002
(D) Between 2000 and 2003

5.A.9.D

- 2 The length of a particular rectangular kitchen countertop is 5 feet longer than its width, w . The perimeter, P , of this countertop is best described by which equation?

- (A) $P = (w + 5)w$ (C) $P = (w + 5) + w$
(B) $P = (w + 5)w + w$ (D) $P = 2(w + 5) + 2w$

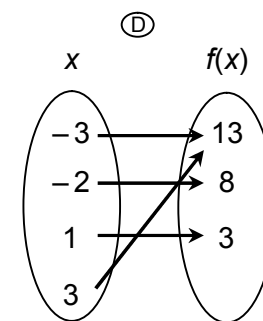
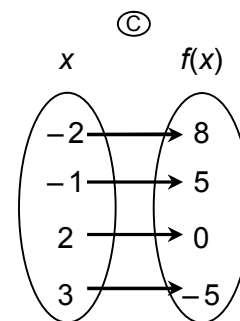
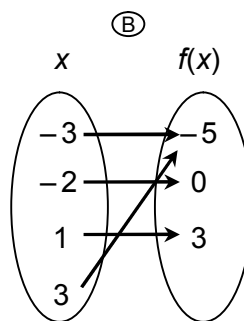
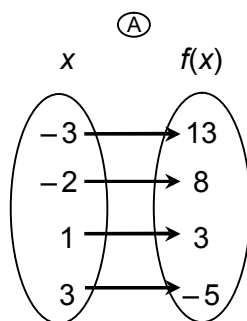
2.A.3.A

- 3 Colton prepares tax returns for individuals. The amount he charges can be represented by the function $c = 18h + 50$, where h represents the number of hours he takes to complete a tax return and c represents the total charge to prepare the tax return. He plans to change the amount charged per tax return. The new cost for preparing a tax return can be represented by the function $c = 18h + 35$. What will be the effect of this change on the amount charged to prepare a tax return?

- (A) The amount he charges for each tax return will decrease by \$15.
(B) The amount he charges for each tax return will increase by \$15.
(C) The amount he charges per hour will decrease by \$15.
(D) The amount he charges per hour will increase by \$15.

3.A.6.F

- 4 Which of these mappings best describes the function $f(x) = -x^2 + 4$?



1.A.1.D

- 5 Which of the expressions below is equivalent to $-4x(3x + 5y) + 6xy - 2x(y + 4)$?

- (A) $-12x^2 + 5y + 4xy + 4$ (C) $-12x^2 - 16xy - 8x$
(B) $-12x^2 + 24xy + 8x$ (D) $-12x^2 - 24xy + 8x$

2.A.4.B

- 7 If -3 is one of the solutions to the quadratic equation $x^2 + x + c = 0$, where c represents an unknown constant, what is the value of c ?

Open/Gridded Response

2.A.4.A

- 6 A pet store owner plans to order from 50 to 80 tropical fish to restock his tanks. The prices of the fish range from \$2.25 to \$5.25 each. If the fish supplier charges a shipping fee of \$0.75 per fish, which of the following is not a reasonable price for the fish, including shipping?

- (A) \$195 (B) \$295 (C) \$395 (D) \$495

4.A.7.C

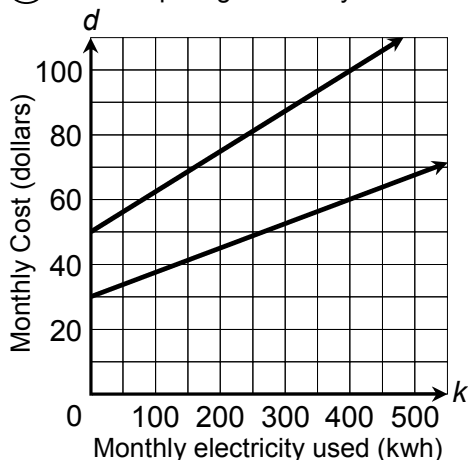
- 8 The number of passengers that can board a certain sized aircraft in a given amount of time is expressed by the equation $y = 150 - 2x - x^2$, where y is the number of passengers boarded and x is the number of minutes required to finish boarding. If 51 passengers board, how many minutes will this take?

- (A) 5 (B) 9 (C) 10 (D) 11

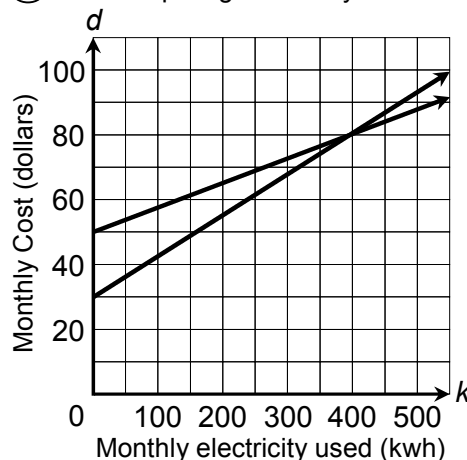
5.A.10.A

Two power providers are marketing their electricity plans to residential customers. Everyday Electric Company offers a plan with a base cost of \$50 per month plus \$0.075 per kilo-watt-hour (kwh) used. Consumer Power Limited offers a plan with a base cost of \$30 per month plus \$0.125 per kilo-watt-hour (kwh) used. Which graph correctly compares the cost of these competing electricity plans?

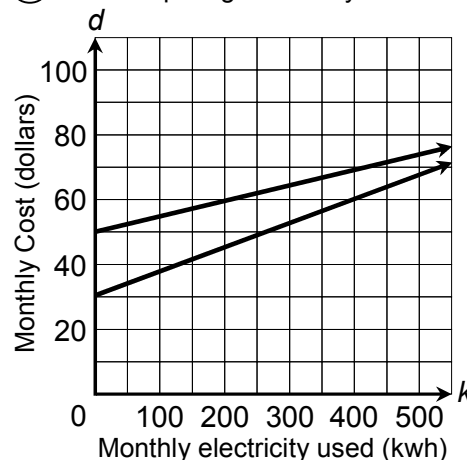
(A) Competing Electricity Plans



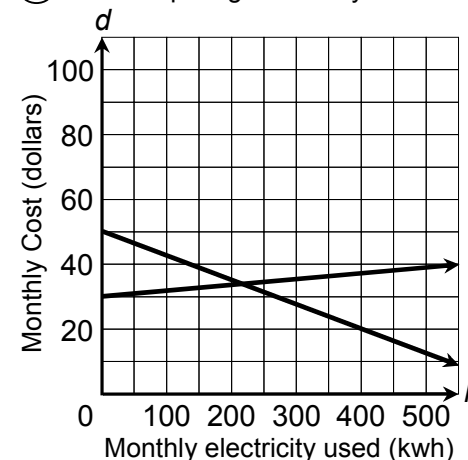
(B) Competing Electricity Plans



(C) Competing Electricity Plans



(D) Competing Electricity Plans



2.A.2.C

Kim is a property surveyor. She charges a base project fee plus an hourly rate for her services. The table shows the current relationship between the number of labor hours, h , and c , the total cost for a property survey.

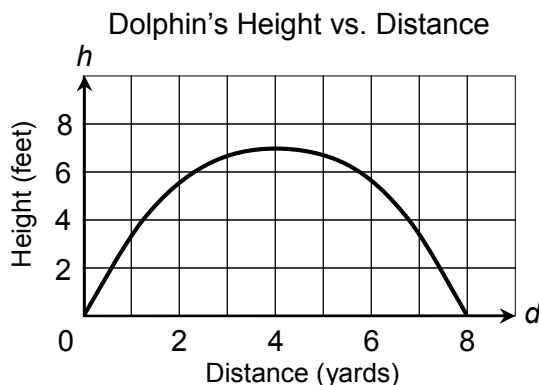
Hours, h	Total Cost, c
1	\$171
2	\$217
5	\$355
8	\$493

If she were to keep her base project fee the same but increase her hourly rate by \$5, what would be the total cost for a 9-hour survey project?

- (A) \$584 (C) \$539
(B) \$544 (D) \$459

3.A.6.F

A marine biologist filmed a dolphin jumping out of the water while swimming and later plotted the relationship of the height, h , and the distance, d , of the jump in the graph below.

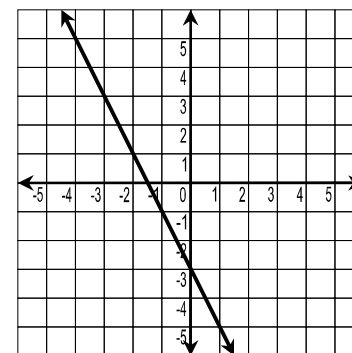


Which of these best represents the range of the graphed relationship?

- (A) 0 to 4 yards (C) 0 to 7 feet
(B) 0 to 8 yards (D) 0 to 4 feet

5.A.9.A

The function $y = -2x - 3$ is shown in the graph.

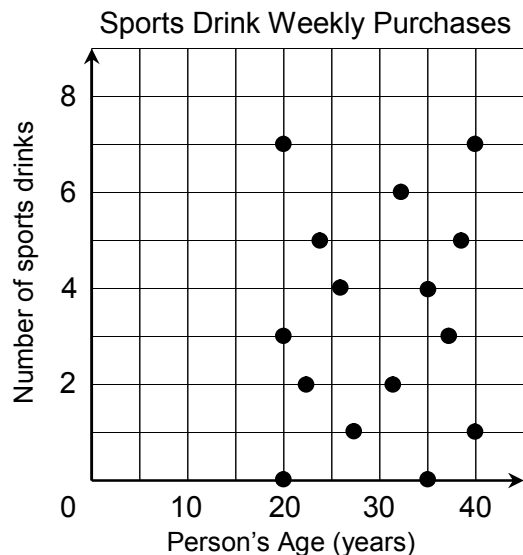


In the given function, the slope will be multiplied by -1 and the y value of the y -intercept will be increased by 2 units. Which of these best represents the new function?

- (A) $y = 4x + 1$ (C) $y = 2x - 3$
(B) $y = 2x - 5$ (D) $y = 2x - 1$

3.A.6.C

- 1 A drink company conducted a survey. It asked 15 people how many sports drinks they purchase each week. Look at the graph.



What is the relationship between a person's age and how many sports drinks he or she purchases weekly?

- (A) The older a person is the more sports drinks he or she buys weekly.
- (B) The younger a person is the more sports drinks he or she buys weekly.
- (C) There is no correlation between an individual's age and the number of sports drinks he or she purchases.
- (D) There is a constant correlation between an individual's age and the number of sports drinks he or she purchases.

2.A.2.D

- 2 Alberto was asked to write the equation $y = 2x - 5$ using function notation. Which of the following function notations would best represent this equation?

- (A) $f(x) = 2x - 5$
- (B) $f(2x) = -5$
- (C) $f(2) = -5$
- (D) $f(-5) = 2$

2.A.4.C

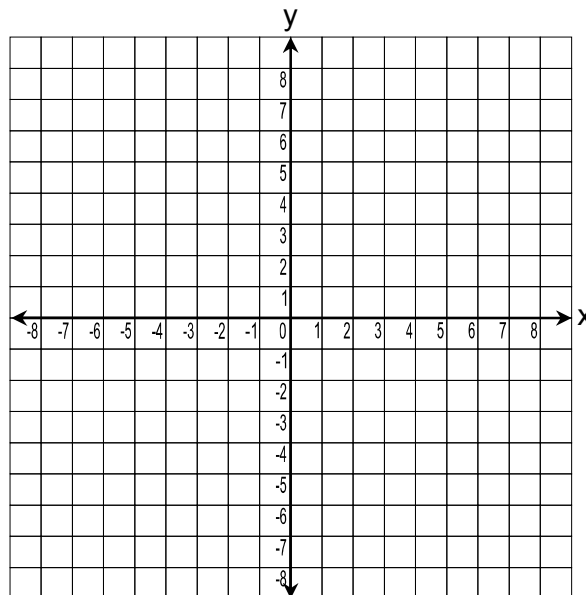
- 3 Which equation best represents the relationship between the corresponding values of x and y given in the table?

x	y
-4	19
-3	15
2	-5
5	-17

- (A) $y = 2x + 27$
- (B) $y = -x + 15$
- (C) $y = -5x - 1$
- (D) $y = -4x + 3$

3.A.5.C

- 4 Use the grid provided to graph $y \leq \frac{2}{3}x + 1$.

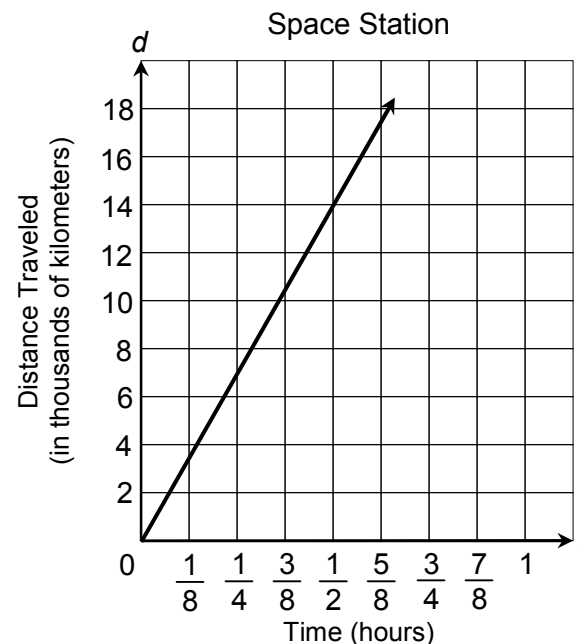


For this inequality, which of these coordinate points is a solution?

- (A) (0, 2)
- (B) (2, -3)
- (C) (-3, 1)
- (D) (4, 5)

4.A.7.B

- 5 The International Space Station orbits the Earth at a constant speed with respect to time as shown on the graph.



Which statement best describes the meaning of the slope of the line representing the situation?

- (A) The space station travels at a speed of approximately 14,000 kilometers per hour.
- (B) The space station travels at a speed of approximately 7,000 kilometers per hour.
- (C) The space station travels at a speed of approximately 28,000 kilometers per hour.
- (D) The space station travels at a speed of approximately 20,000 kilometers per hour.

3.A.6.B

- 6 For the equation $3x^2 - 9x - 54 = 0$, what is the solution set?

- (A) $\{-3, 6\}$
- (B) $\{-3, -6\}$
- (C) $\{3, 6\}$
- (D) $\{3, -6\}$

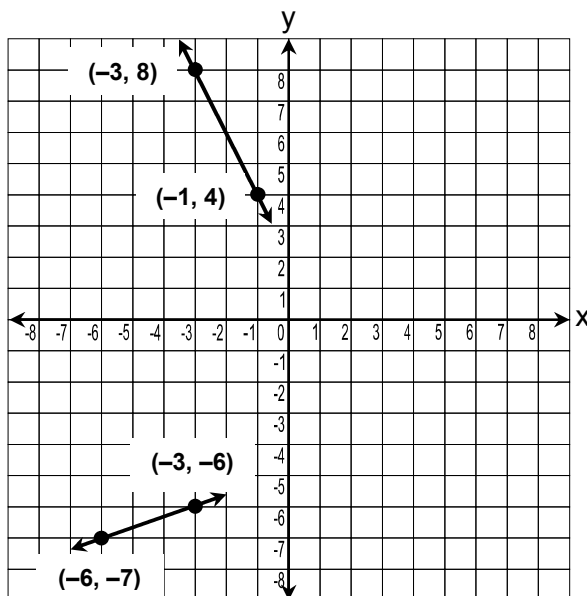
5.A.10.A

1 Alyssa wants to buy a computer for \$600. If she pays \$75 now and \$25 each month, she can pay for it in 21 months. If she were to pay \$75 now and \$35 each month, how would the number of payments change?

- Ⓐ She would make 15 fewer monthly payments.
- Ⓑ She would make 3 fewer monthly payments.
- Ⓒ She would make 5 fewer monthly payments.
- Ⓓ She would make 6 fewer monthly payments.

3.A.6.F

2 The graph of a system of linear equations is shown.



Which of these is a solution for this system of equations?

- Ⓐ (3, -4) Ⓒ (2, -3)
- Ⓑ (0, -5) Ⓓ (0, 2)

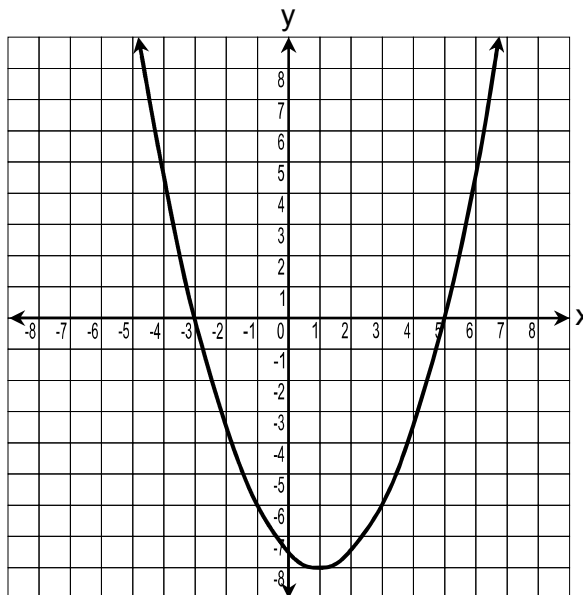
4.A.8.B

3 A local sports stadium must collect a 9.25% sales tax on all tickets that it sells. The sales tax collected on an item is a function of the item's price. Which of the following is the dependent quantity in this situation?

- Ⓐ The sales tax rate
- Ⓑ The sales tax amount for a ticket
- Ⓒ The price of each ticket
- Ⓓ The number of seats in the stadium

1.A.1.A

4 The graph of a quadratic function is shown.

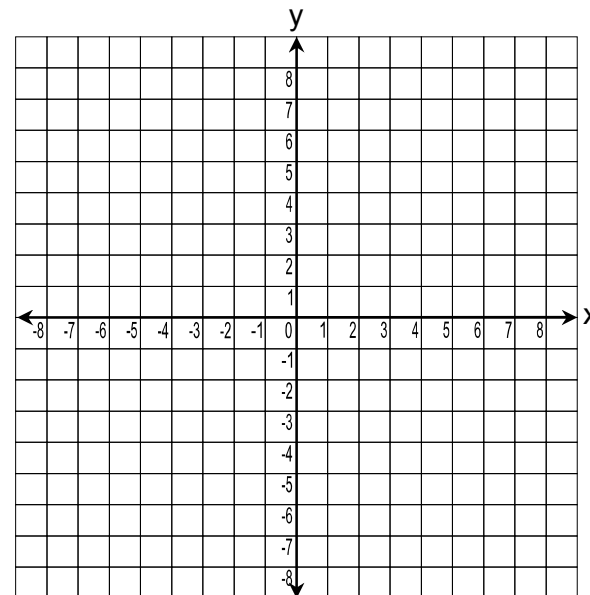


Which statement is not true about this graph?

- Ⓐ The graph has an x-intercept at (-3, 0).
- Ⓑ The graph has a minimum point at (1, -8).
- Ⓒ The graph's line of symmetry is the y-axis.
- Ⓓ The graph has a y-intercept of (0, -7.5).

5.A.9.D

5 Which of the following statements best describes the situation if the slope of equation $y = \frac{3}{4}x - 5$ is changed to $-\frac{3}{4}$ and the y-intercept is changed to (0, 5)?



- Ⓐ The original line and the new line have the same y-intercept.
- Ⓑ The original line and the new line have the same x-intercept.
- Ⓒ The original line is perpendicular to the new line.
- Ⓓ The original line is parallel to the new line.

3.A.6.C

6 Which of the following is equivalent to $3x - 4y \leq 16$?

- Ⓐ $y \geq \frac{3}{4}x - 4$ Ⓒ $y \geq \frac{4}{3}x + 4$
- Ⓑ $y \leq \frac{4}{3}x + 4$ Ⓓ $y \leq \frac{3}{4}x - 4$

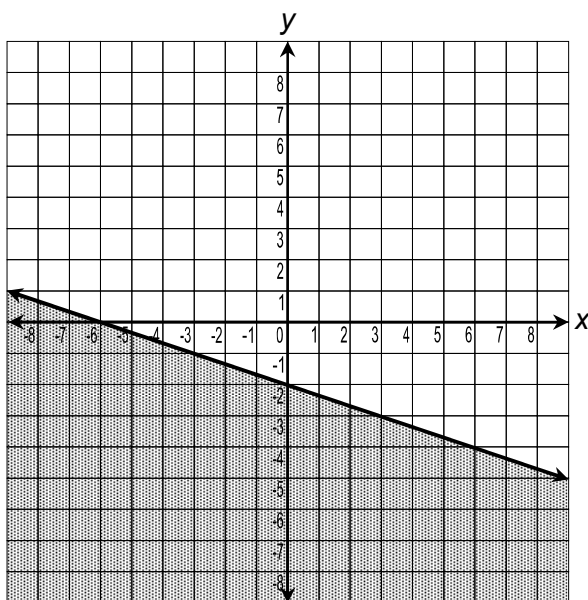
2.A.4.A

1 Charles graphed a series of $y = ax^2 + 2$ equations. As he decreased the value of a from 3 to $2\frac{1}{3}$ to 1 and finally to $\frac{1}{3}$, how did each new graph compare to the previous graph?

- (A) Each new graph was wider than the previous graph.
- (B) Each new graph was narrower than the previous graph.
- (C) Each new graph was to the left of the previous graph.
- (D) Each new graph was below the previous graph.

5.A.9.B

2 Which inequality best describes the graph shown below?



- (A) $y \leq \frac{1}{3}x - 2$
- (B) $y \leq -\frac{1}{3}x - 2$
- (C) $y \geq -\frac{1}{3}x - 2$
- (D) $y \geq \frac{1}{3}x - 2$

1.A.1.D

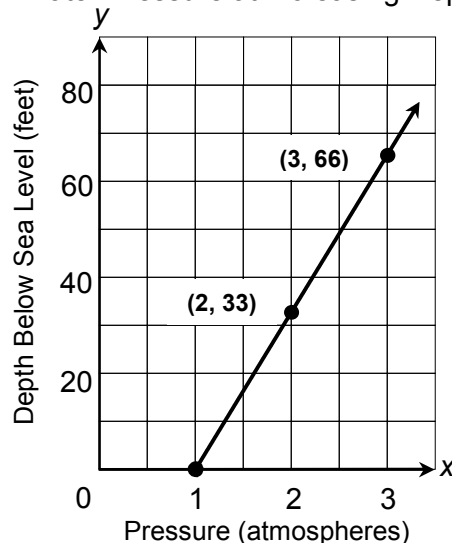
3 The difference between the perimeters of two different squares is 16 inches and the sum of their perimeters is 40 inches. If x represents the length of a side of the larger square and y represents the length of a side of the smaller square, which of these systems of equations can be used to find the dimensions of each square?

- (A) $2y - 2x = 16$
 $2x + 2y = 40$
- (B) $4x - 2y = 16$
 $4x + 2y = 40$
- (C) $x - y = 16$
 $x + y = 40$
- (D) $4x - 4y = 16$
 $4x + 4y = 40$

4.A.8.A

4 Scuba divers can use the graphed linear function below to find the relationship between water pressure, in terms of multiples of the atmospheric pressure at 0 feet sea level, and their diving water depth measured in feet below sea level.

Water Pressure at Increasing Depths



According to the graphed relationship, at what depth would the water pressure be equal to 4 atmospheres?

- (A) 70
- (B) 80
- (C) 99
- (D) 132

3.A.6.E

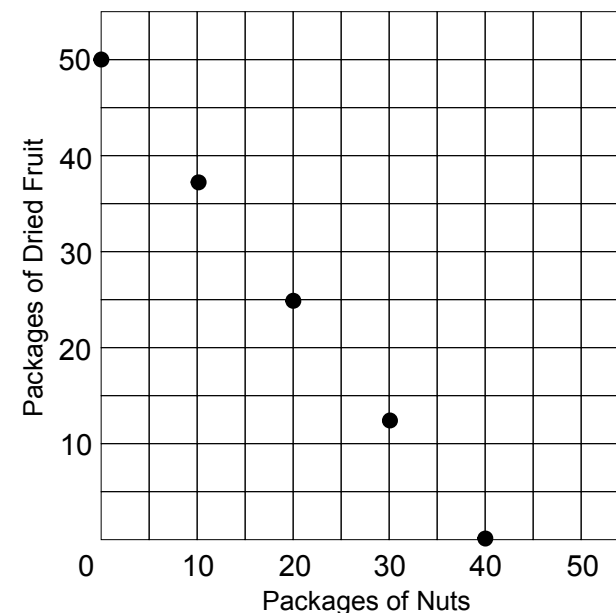
5 Patricia works at an electronics store. She is paid \$9 an hour plus a 6% commission on her total sales. Which of the following best represents e , her total monthly earnings, if she works 160 hours and has total sales of s dollars?

- (A) $e = 9(160) + 6s$
- (B) $e = 0.09(160) + 0.06s$
- (C) $e = 9(160) + 0.6s$
- (D) $e = 9(160) + 0.06s$

1.A.1.C

6 The number of packages of dried fruit and the number of packages of nuts that a snack food company can pack in a shipping case with 200 ounces of product is shown on the graph.

200 Ounces of Product



What is the maximum number of packages of dried fruit that would make exactly 200 ounces of product in a shipping case?

Open/Gridded Response.

3.A.6.B

Order all 10 series of **Countdown** at
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