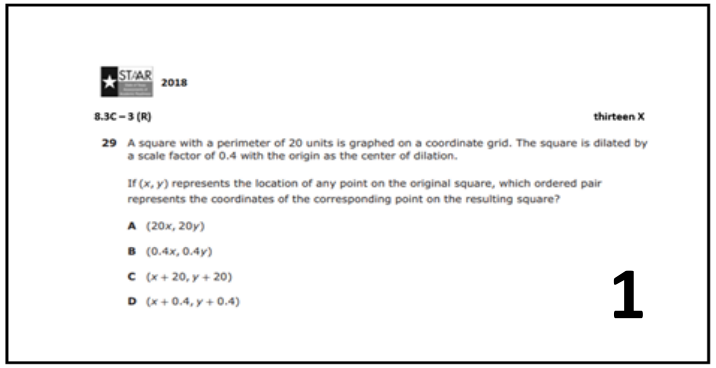
STAAR Items in A Box

Algebra I EOC

Supporting Standards

Key Code:

A → F → W
B → G → X
A → H → Y
A → J → Z



STAAR 2018

8.3C – 3 (R) thirteen X

29 A square with a perimeter of 20 units is graphed on a coordinate grid. The square is dilated by a scale factor of 0.4 with the origin as the center of dilation.

If (x, y) represents the location of any point on the original square, which ordered pair represents the coordinates of the corresponding point on the resulting square?

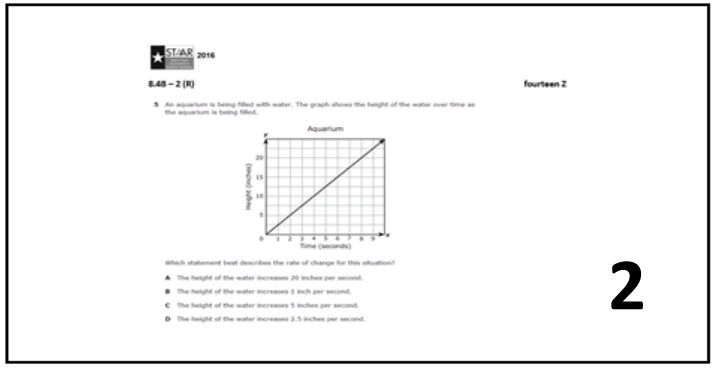
A $(20x, 20y)$

B $(0.4x, 0.4y)$

C $(x + 20, y + 20)$

D $(x + 0.4, y + 0.4)$

1



STAAR 2016

8.4B – 2 (R) fourteen Z

5 An aquarium is being filled with water. The graph shows the height of the water over time as the aquarium is being filled.

Aquarium

Height (inches)

Time (seconds)

Which statement best describes the rate of change for this situation?

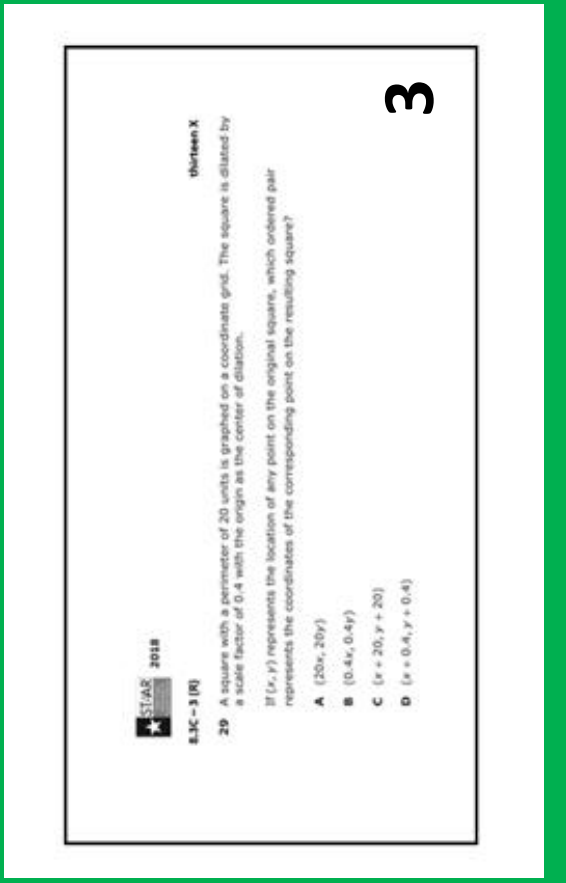
A The height of the water increases 20 inches per second.

B The height of the water increases 1 inch per second.

C The height of the water increases 5 inches per second.

D The height of the water increases 2.5 inches per second.

2



3

thirteen X

STAAR 2018

8.3C – 3 (R)

29 A square with a perimeter of 20 units is graphed on a coordinate grid. The square is dilated by a scale factor of 0.4 with the origin as the center of dilation.

If (x, y) represents the location of any point on the original square, which ordered pair represents the coordinates of the corresponding point on the resulting square?

A $(20x, 20y)$

B $(0.4x, 0.4y)$

C $(x + 20, y + 20)$

D $(x + 0.4, y + 0.4)$

STAAR ALGEBRA I REFERENCE MATERIALS

FACTORING

Perfect square trinomials	$a^2 + 2ab + b^2 = (a + b)^2$ $a^2 - 2ab + b^2 = (a - b)^2$
Difference of squares	$a^2 - b^2 = (a - b)(a + b)$

PROPERTIES OF EXPONENTS

Product of powers	$a^m a^n = a^{(m+n)}$
Quotient of powers	$\frac{a^m}{a^n} = a^{(m-n)}$
Power of a power	$(a^m)^n = a^{mn}$
Rational exponent	$a^{\frac{m}{n}} = \sqrt[n]{a^m}$
Negative exponent	$a^{-n} = \frac{1}{a^n}$

LINEAR EQUATIONS

Standard form	$Ax + By = C$
Slope-intercept form	$y = mx + b$
Point-slope form	$y - y_1 = m(x - x_1)$
Slope of a line	$m = \frac{y_2 - y_1}{x_2 - x_1}$

QUADRATIC EQUATIONS

Standard form	$f(x) = ax^2 + bx + c$
Vertex form	$f(x) = a(x - h)^2 + k$
Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Axis of symmetry	$x = \frac{-b}{2a}$

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A.2B – 3 (S) **one Y**

46 Which equation in standard form has a graph that passes through the point (–4, 2) and has a slope of $\frac{9}{2}$?

F $9x - 2y = 36$

G $9x - 2y = 26$

H $9x - 2y = -40$

J $9x - 2y = -10$

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A.2B – 3 (S) **two Y**

23 What is the equation in slope-intercept form of the line that passes through the points (–4, 47) and (2, –16)?

A $y = -\frac{21}{2}x + \frac{979}{21}$

B $y = -\frac{2}{21}x + \frac{979}{21}$

C $y = -\frac{21}{2}x + 5$

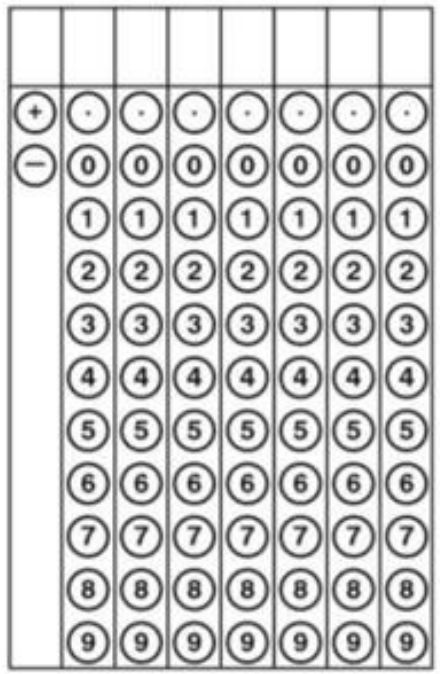
D $y = -\frac{2}{21}x + 5$

STAAR 2016

A.2D – 3 (S) three

42 In an electrical circuit, the voltage across a resistor is directly proportional to the current running through the resistor. If a current of 12 amps produces 480 volts across a resistor, how many volts would a current of 1.5 amps produce across an identical resistor?

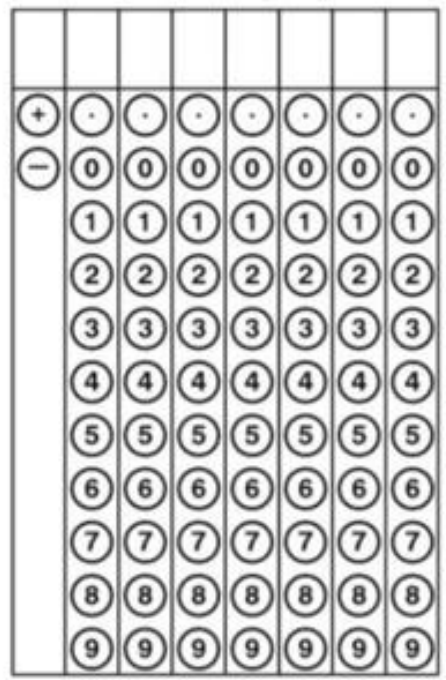
Record your answer and fill in the bubbles on your answer document.



STAAR 2017

A.2D – 3 (S) **four**

27 The value of y is directly proportional to the value of x. If $y = 35$ when $x = 140$, what is the value of y when $x = 70$?



STAAR 2018

A.2D – 3 (S) five J

10 The value of y varies directly with x. If $x = 3$, then $y = 21$. What is the value of x when $y = 105$?

F $\frac{3}{5}$

G $1\frac{2}{3}$

H 7

J 15

STAAR 2018

A.2F – 3 (S) six Z

39 What is the equation in slope-intercept form of the line that passes through the point $(2, -2)$ and is perpendicular to the line represented by $y = \frac{2}{5}x + 2$?

A $y = \frac{5}{2}x - 7$

B $y = \frac{5}{2}x + 7$

C $y = -\frac{5}{2}x - 3$

D $y = -\frac{5}{2}x + 3$

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A.2G – 3 (S) **seven Z**

36 What is the equation of the line that passes through the point $(-2, 7)$ and has a slope of zero?

F $x = 7$

G $y = -2$

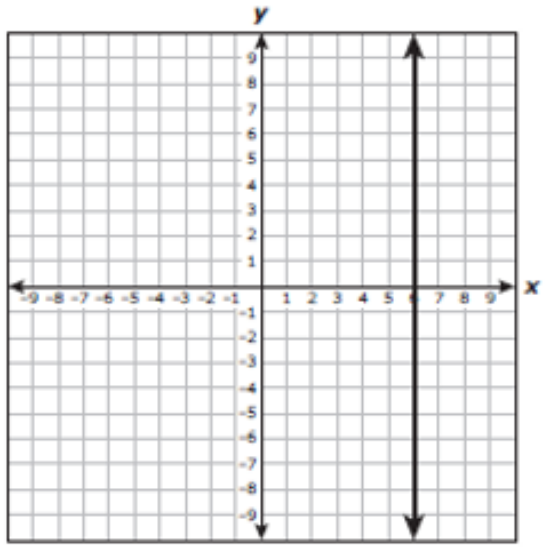
H $x = -2$

J $y = 7$

STAAR 2018

A.2G – 3 (S) **eight Z**

32 What are the equation and slope of the line shown on the grid?



F $y = 6$; slope is $-\frac{1}{6}$.

G $x = 6$; slope is zero.

H $y = 6$; slope is 6.

J $x = 6$; slope is undefined.

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A.2H – 3 (S) **nine X**

3 Baseball fans can buy tickets for seats in the lower deck or upper deck of the stadium. Tickets for the lower deck cost $42 each. Ticket prices for the upper deck are 75% of the cost of tickets for the lower deck. Which inequality represents all possible combinations of x, the number of tickets for the lower deck, and y, the number of tickets for the upper deck, that someone can buy for no more than $800?

A $42x + 56y \leq 800$

B $42x + 31.5y \leq 800$

C $42x + 56y > 800$

D $42x + 31.5y > 800$

STAAR 2017

A.2H – 3 (S) **ten X**

25 A student is ordering a flower arrangement. She can choose any combination of roses and carnations for her flower arrangement, and she does not want to spend more than $30.

If roses cost $3 each and carnations cost $2 each, which inequality represents all possible combinations of x roses and y carnations?

A $3x + 2y < 30$

B $3x + 2y \leq 30$

C $2x + 3y > 30$

D $2x + 3y \leq 30$

STAAR 2016

A.3A – 2 (S) **eleven W**

51 What is the slope of the line that passes through the points (26, 7) and (–39, 12)?

A $-\frac{1}{13}$

B $\frac{5}{13}$

C –13

D $\frac{13}{5}$

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A.3A – 2 (S) twelve Z

16 What is the slope of the line represented by $5x - 12y = 24$?

F -2

G $\frac{24}{5}$

H -12

J $\frac{5}{12}$

51 What is the slope of the line that passes through the points $(5, -11)$ and $(-9, 17)$?

A -2

B $-\frac{1}{2}$

C 7

D 2

11 Linear function $f(x) = x$ is graphed on a coordinate plane. The graph of a new line is formed by changing the slope of the original line to $\frac{2}{3}$ and the y-intercept to 4. Which statement about the relationship between these two graphs is true?

A The graph of the new line is steeper than the graph of the original line, and the y-intercept has been translated down.

B The graph of the new line is less steep than the graph of the original line, and the y-intercept has been translated up.

C The graph of the new line is steeper than the graph of the original line, and the y-intercept has been translated up.

D The graph of the new line is less steep than the graph of the original line, and the y-intercept has been translated down.

STAAR 2017

A.3E – 2 (S) fifteen W

45 A student graphed $f(x) = x$ and $g(x) = f(x) + 3$ on the same coordinate grid. Which statement describes how the graphs of f and g are related?

A The graph of f is shifted 3 units up to create the graph of g.

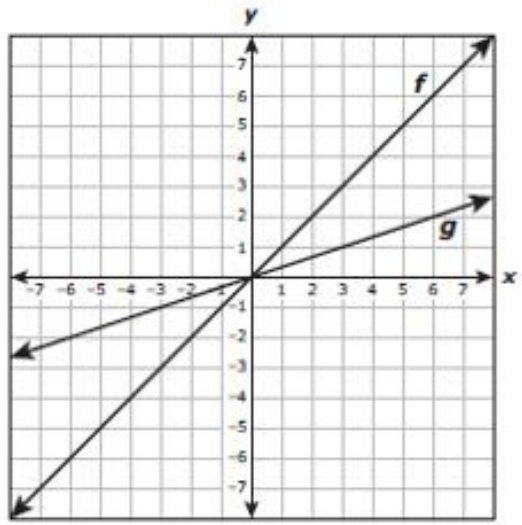
B The graph of f is steeper than the graph of g.

C The graph of f is shifted 3 units down to create the graph of g.

D The graph of f is less steep than the graph of g.

A.3E – 2 (S) **sixteen X**

35 The graphs of linear functions f and g are shown on the grid.



Which function is best represented by the graph of g?

A $g(x) = f(x) - 4$

B $g(x) = \frac{1}{3}f(x)$

C $g(x) = f(x) - 2$

D $g(x) = 3f(x)$

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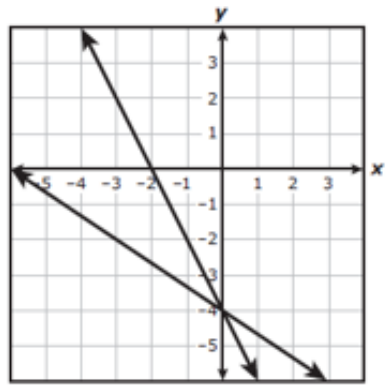
A.3F – 2 (S) **seventeen W**

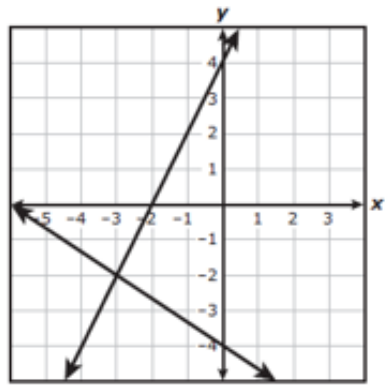
32 Which graph can be used to find the solution to the system of equations below?

$$2x + y = -4$$
$$-3y = 2x + 12$$

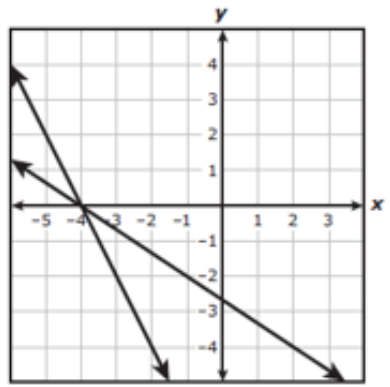
F



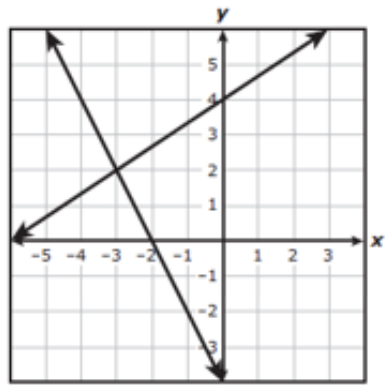
H



G

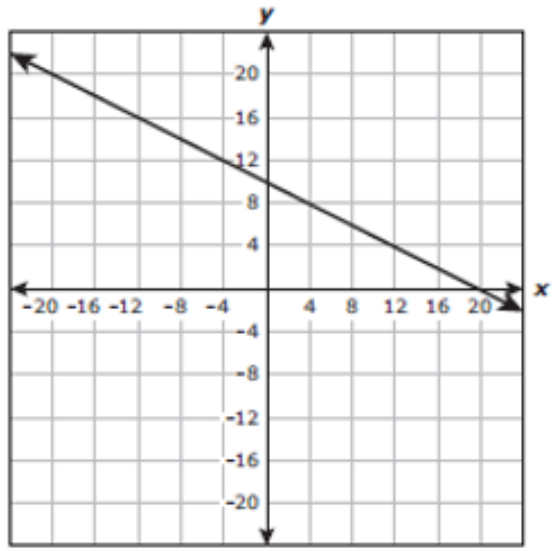


J



A.3F – 2 (S) **eighteen Y**

29 The line graphed on the grid represents the first of two equations in a system of linear equations.



If the graph of the second equation in the system passes through the points (–12, 20) and (4, 12), which statement is true?

A The only solution to the system is (10, 5).

B The only solution to the system is (0, 14).

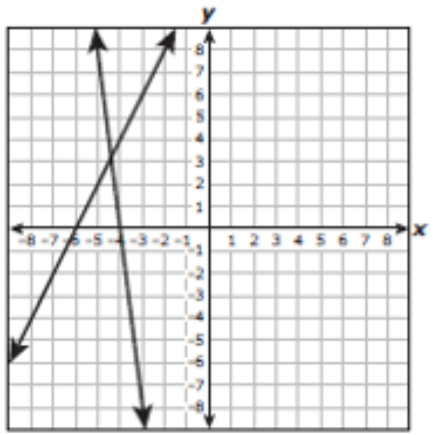
C The system has no solution.

D The system has an infinite number of solutions.

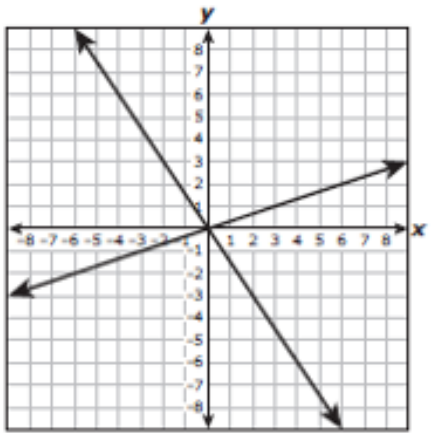
A.3F – 2 (S) **nineteen Z**

3 Which graph best represents a system of equations that has no solution?

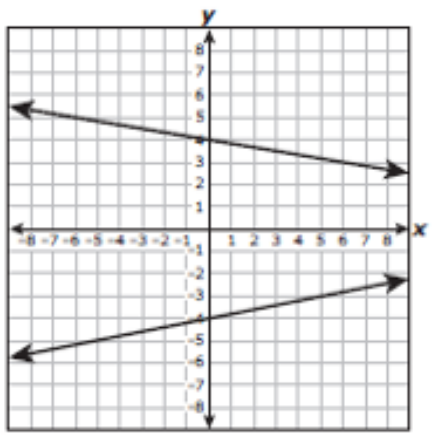
A



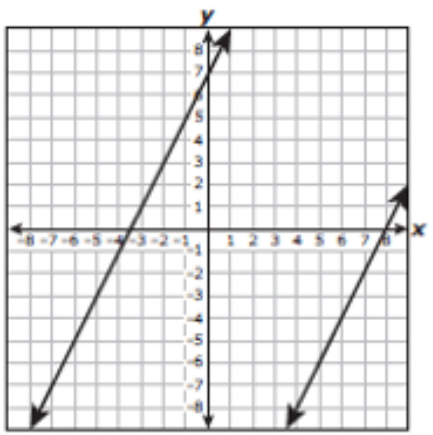
C



B



D



STAAR 2017

A.4A – 2 (S) **twenty Y**

19 The table shows the heights and the lengths of several rectangles.

Height (in.)	41	70	21	34	10	92	54	24	10	35	42	66
Length (in.)	21	25	32	12	16	45	40	23	45	35	21	14

What does the correlation coefficient for the data indicate about the strength of the linear association between the height and the length of these rectangles?

A Weak negative correlation

B Strong negative correlation

C Weak positive correlation

D Strong positive correlation

9 Which situation best represents causation?

A When the number of bus stops increases, the number of car sales decreases.

B When fewer firefighters report to a house fire, the damage caused by the fire decreases.

C When ice cream sales increase, incidents of sunburn increase.

D When it rains several inches, the water level of a lake increases.

25 Which situation does NOT show causation?

A When the student population at a school increases, the number of teachers at the school increases.

B When the amount of sugar in a quart of apple juice is reduced, there are fewer calories in each serving.

C When there are more workers on a project, the project is completed in less time.

D When there is more protein in an athlete's diet, the athlete scores more points in a game.

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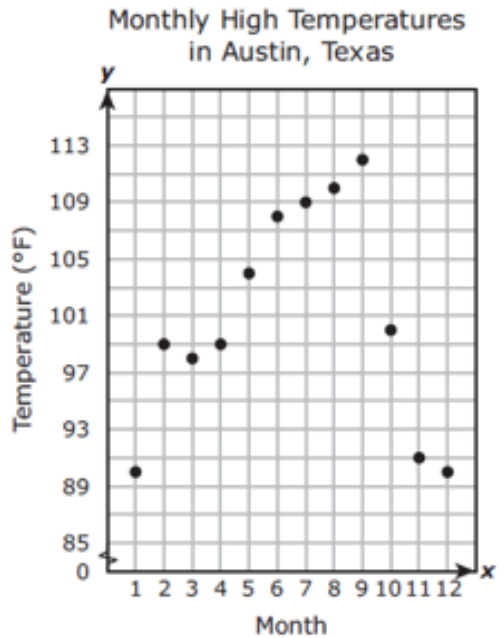
A.4C – 2 (S) **twenty three Y**

26 The scatterplot shows the monthly high temperatures for Austin, Texas, in degrees Fahrenheit over a 12-month period.



Which function best models the data from Month 1 to Month 9?

F $y = -1.6x + 111$

G $y = 3.5x + 85$

H $y = 2.5x + 90$

J $y = -3.3x + 130$

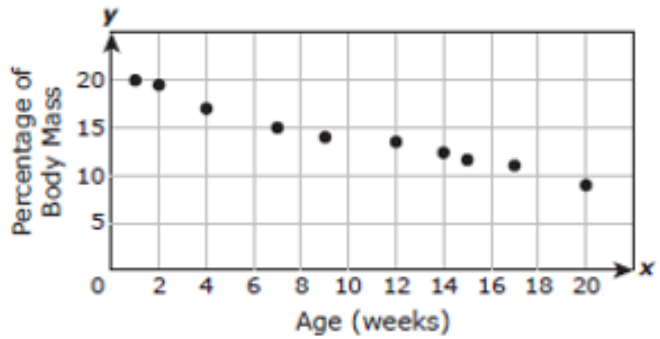
A.4C – 2 (S)

twenty four X

12 A zookeeper recorded the feeding schedule for a baby rhinoceros for 20 weeks. The table and scatterplot show the percentage of the baby rhinoceros's body mass that was used to determine the amount of food given at each feeding as a linear function of its age in weeks.

Baby Rhinoceros Feeding Schedule

Age (weeks)	1	2	4	7	9	12	14	15	17	20
Percentage of Body Mass	20	19.5	17	15	14	13.5	12.4	11.6	11	9



What is the best prediction of the percentage of the baby rhinoceros's body mass that should be used to determine the amount of food given at each feeding when it is 25 weeks old?

F 8.5%

G 6%

H 2.5%

J 10%

STAAR 2016

A.5B – 3 (S) twenty five X

33 Which inequality describes all the solutions to $5(3 - x) < -2x + 6$?

A $x < -9$

B $x > 3$

C $x < -3$

D $x > 7$

30 What is the solution set for $-4x + 10 \geq 5x + 55$?

F $x \geq 5$

G $x \geq 45$

H $x \leq -5$

J $x \leq -45$

STAAR 2017

A.6B – 4 (S) **twenty seven Z**

43 Which quadratic function in vertex form can be represented by the graph that has a vertex at $(3, -7)$ and passes through the point $(1, -10)$?

A $y = \frac{3}{4}(x + 3)^2 + 7$

B $y = -\frac{3}{4}(x + 3)^2 - 7$

C $y = \frac{3}{4}(x - 3)^2 + 7$

D $y = -\frac{3}{4}(x - 3)^2 - 7$

26 Which function is equivalent to $f(x) = -4(x + 7)^2 - 6$?

F $f(x) = -4x^2 - 56x - 202$

G $f(x) = -4x^2 + 14x + 43$

H $f(x) = -4x^2 - 56x - 172$

J $f(x) = -4x^2 + 190$

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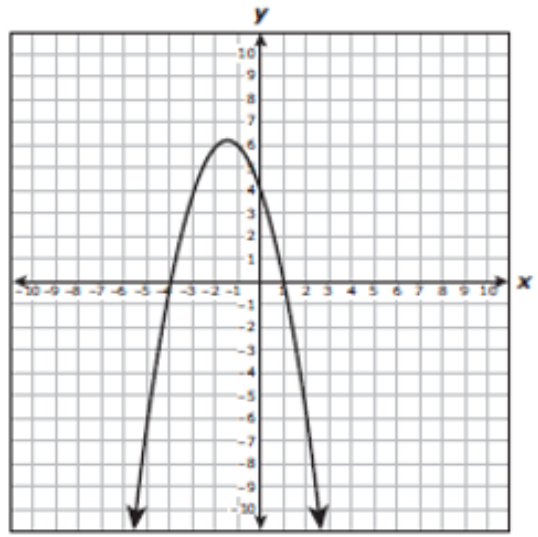
A.6C– 4 (S) **twenty nine X**

10 The graph of a quadratic function is shown on the grid.



Which function is best represented by this graph?

F $f(x) = x^2 + 3x - 4$

G $f(x) = -x^2 - 3x + 4$

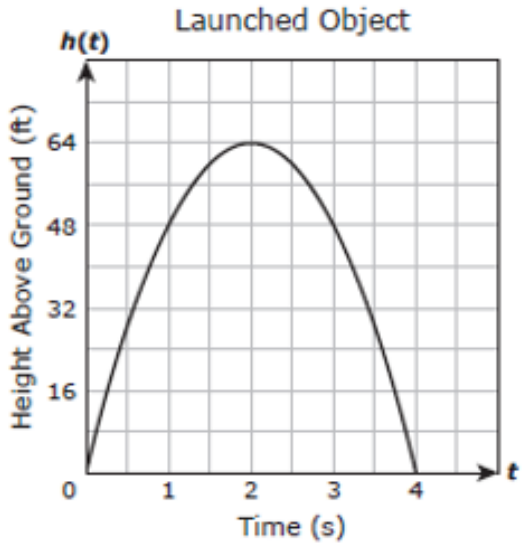
H $f(x) = x^2 - 3x - 4$

J $f(x) = -x^2 + 3x + 4$

STAAR 2018

A.6C – 4 (S) **thirty y**

7 The graph shows the height in feet of an object above the ground t seconds after it was launched from the ground.



Which function is best represented by the graph of this situation?

A $h(t) = -16t^2 - 64t$

B $h(t) = -16t^2 + 128t - 256$

C $h(t) = -16t^2 + 64t$

D $h(t) = -16t^2 - 128t - 256$

16 Which statement about $k(x) = -x^2 - 2x + 15$ is true?

F The zeros are -3 and 5, because $k(x) = -(x + 3)(x - 5)$.

G The zeros are -5 and 3, because $k(x) = -(x + 5)(x - 3)$.

H The zeros are -5 and -3, because $k(x) = -(x + 5)(x + 3)$.

J The zeros are 3 and 5, because $k(x) = -(x - 3)(x - 5)$.

37 Which statement about $f(x) = 2x^2 - 3x - 5$ is true?

A The zeros are $-\frac{5}{2}$ and -1, because $f(x) = (x + 1)(2x + 5)$.

B The zeros are $-\frac{5}{2}$ and 1, because $f(x) = (x - 1)(2x + 5)$.

C The zeros are -1 and $\frac{5}{2}$, because $f(x) = (x + 1)(2x - 5)$.

D The zeros are 1 and $\frac{5}{2}$, because $f(x) = (x - 1)(2x - 5)$.

18 Which statement about $g(x) = x^2 - 576$ is true?

F The zeros, -288 and 288, can be found when $0 = (x + 288)(x - 288)$.

G The only zero, 288, can be found when $0 = (x - 288)^2$.

H The zeros, -24 and 24, can be found when $0 = (x + 24)(x - 24)$.

J The only zero, 24, can be found when $0 = (x - 24)^2$.

STAAR 2017

A.8B – 4 (S) **thirty four X**

39 A projectile is launched into the air from the ground. The table shows the height of the projectile, $h(t)$, at different times.

Projectile Height

Time (seconds)	Height (meters)
5	1,353
10	2,460
15	3,323
20	3,940
25	4,313
30	4,440
35	4,323

Based on the table, which function can best be used to model this situation?

A $h(t) = 99t^2 + 858$

B $h(t) = -4.9t^2 + 295t + 0.6$

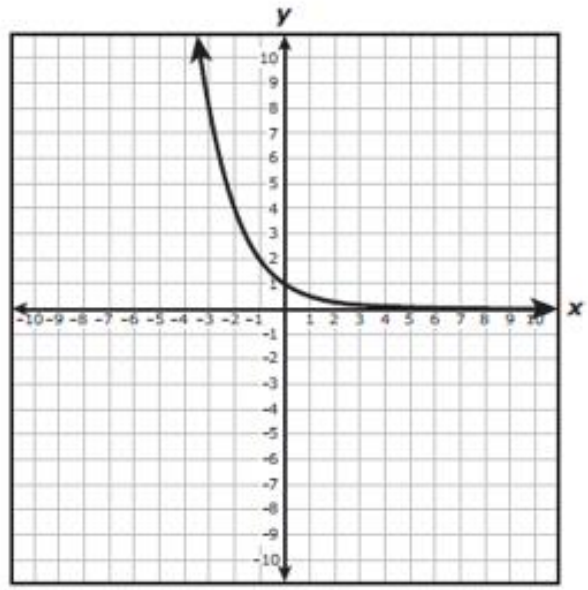
C $h(t) = -4.9t^2 + 295t + 2$

D $h(t) = 99t^2 + 1{,}470.3$

STAAR 2016

A.9A – 5 (S) **thirty five Y**

21 The graph of an exponential function is shown on the grid.



Based on the graph, which statement about the function is true?

A The range is the set of all real numbers less than 0.

B The domain is the set of all real numbers greater than –4.

C The range is the set of all real numbers greater than 0.

D The domain is the set of all real numbers less than –4.

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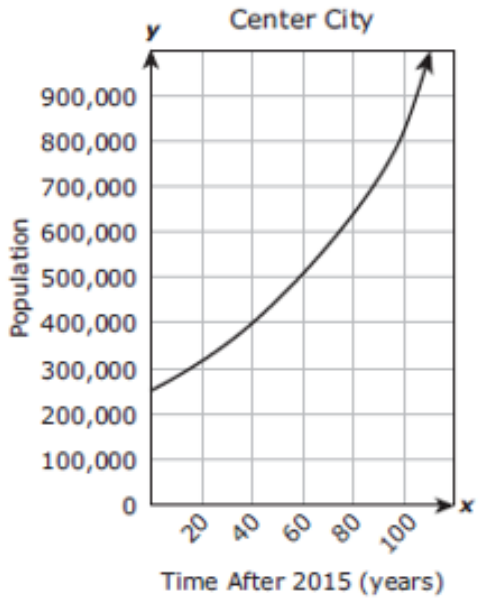
A.9A – 5 (S)

thirty six X

21 The population of Center City is modeled by exponential function f, where x is the number of years after the year 2015. The graph of f is shown on the grid.



Which inequality best represents the range of f in this situation?

A $x \geq 0$

B $y \geq 250{,}000$

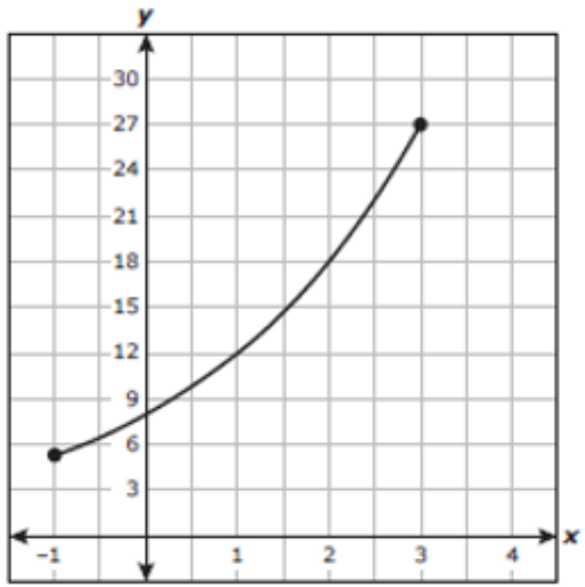
C $0 \leq x \leq 110$

D $250{,}000 \leq y \leq 1{,}000{,}000$

STAAR 2018

A.9A – 5 (S) **thirty seven W**

23 What appears to be the domain of the part of the exponential function graphed on the grid?



A $-1 \leq x \leq 3$

B $-1 \leq y \leq 3$

C $5.3 \leq x \leq 27$

D $5.3 \leq y \leq 27$

STAAR 2017

A.9B – 5 (S) **three Z**

31 A student used $f(x) = 5.00(1.012)^x$ to show how the balance in a savings account will increase over time. What does the 5.00 represent?

A The interest the savings account earned for the first year

B The annual interest rate of the savings account

C The number of years the savings account has earned interest

D The starting balance of the savings account

STAAR 2018

A.9B – 5 (S) **three Y**

46 Scientists are studying a bacteria sample. The function $f(x) = 245(1.12)^x$ gives the number of bacteria in the sample at the end of x days.

Which statement is the best interpretation of one of the values in this function?

F The initial number of bacteria is 12.

G The initial number of bacteria decreases at a rate of 88% each day.

H The number of bacteria increases at a rate of 12% each day.

J The number of bacteria at the end of one day is 245.

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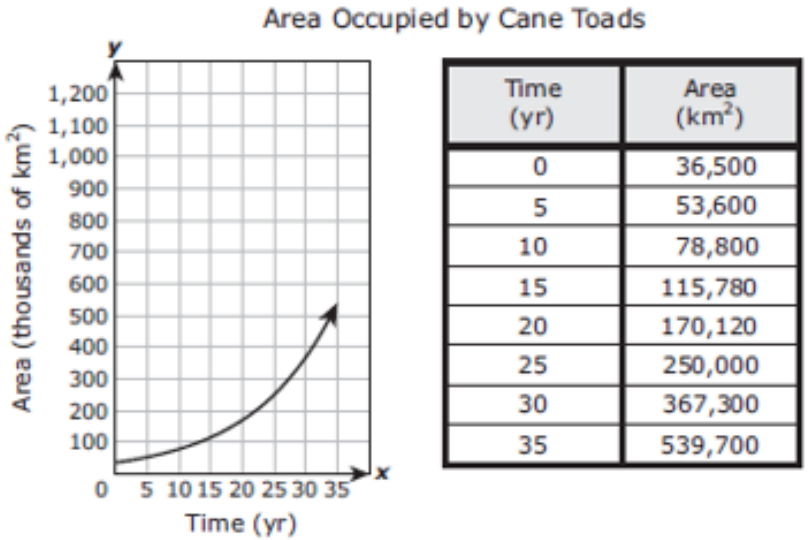
A.9E – 5 (S) **one Z**

17 The exponential function modeled below represents the number of square kilometers of land occupied by cane toads x years after this animal was first introduced into Australia.



Time (yr)	Area (km^2)
0	36,500
5	53,600
10	78,800
15	115,780
20	170,120
25	250,000
30	367,300
35	539,700

Based on the data, which measurement is closest to the number of square kilometers of land that will be occupied by cane toads 40 years after this animal was first introduced into Australia?

A 550,000 km^2

B 1,250,000 km^2

C 600,000 km^2

D 800,000 km^2

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A.10A – 1 (S) **one X**

2 Which expression is equivalent to $2x^2 + (4x - 6x^2) + 9 - (6x + 3)$?

F $-4x^2 - 2x + 12$

G $-4x^2 - 2x + 6$

H $-10x + 6$

J $18x + 12$

STAAR 2017

A.10A – 1 (S) **three W**

13 A shoe company is going to close one of its two stores and combine all the inventory from both stores. These polynomials represent the inventory in each store:

Store A: $\frac{1}{2}g^2 + \frac{7}{2}$

Store B: $3g^2 - \frac{4}{5}g + \frac{1}{4}$

Which expression represents the combined inventory of the two stores?

A $\frac{7}{2}g^2 - \frac{4}{5}g + \frac{15}{4}$

B $\frac{7}{2}g^2 - \frac{4}{5}g + \frac{4}{3}$

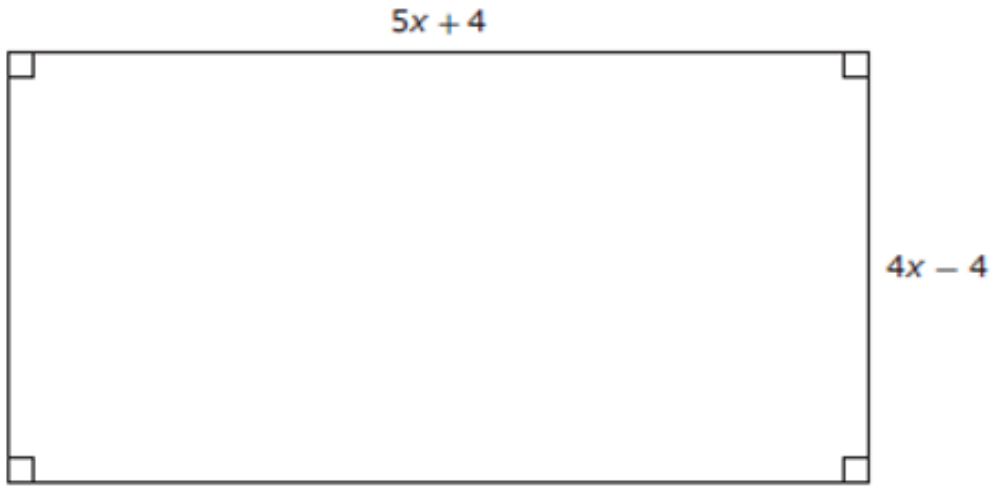
C $\frac{7}{2}g^2 + \frac{4}{5}g + \frac{15}{4}$

D $\frac{7}{2}g^2 + \frac{4}{5}g + \frac{4}{3}$

STAAR 2016

A.10B – 1 (S) **one X**

54 The diagram shows the floor plan of a storage facility. All dimensions are given in feet.



Which expression represents the area of the storage facility in square feet?

F $20x^2 + 36x - 16$

G $20x^2 - 4x - 16$

H $16x^2 - 16$

J $9x^2 - 16$

STAAR 2018

A.10B – 1 (S) one W

36 Which expression is equivalent to $(h^2 + 9h - 1)(-4h + 3)$?

F $-4h^3 - 33h^2 + 31h - 3$

G $4h^3 + 39h^2 - 23h - 3$

H $-4h^3 - 39h^2 + 23h + 3$

J $4h^3 + 33h^2 - 31h + 3$

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A.10D – 1 (S) one Y

15 Which expression is equivalent to $9q^2 - \frac{2}{3}(3q - 7) + 5q^2$?

A $9q^2 - \frac{5}{3}q - 3$

B $9q^2 - 2q - 3$

C $14q^2 - 2q + \frac{14}{3}$

D $14q^2 - \frac{5}{3}q - \frac{14}{3}$

STAAR 2018

A.10D – 1 (S) three X

2 Which expression is equivalent to $-28x^2 + 35x$?

F $7x(4x + 5)$

G $-7x(4x - 5)$

H $7x(4x - 5)$

J $-7x(4x + 5)$

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A.10F– 1 (S) one Z

25 Which expression is a factor of $36x^2 - 49$?

A $18x - 7$

B $6x - 49$

C $18x - 49$

D $6x - 7$

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A.11A – 1 (S) three X

1 Which expression is equivalent to $\sqrt{147}$?

A $3\sqrt{7}$

B $7\sqrt{3}$

C $21\sqrt{7}$

D $49\sqrt{3}$

STAAR 2018

A.11A – 1 (S) one Z

53 Which expression is equivalent to $\sqrt{96}$?

A 24

B $8\sqrt{6}$

C 48

D $4\sqrt{6}$

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A.12A – 1 (S) **one X**

36 Which table represents y as a function of x?

F

x	y
−5	−5
3	−2
−5	5
−3	−2

H

x	y
−3	−4
1	4
−3	4
1	−4

G

x	y
6	−6
−6	6
8	−8
−8	8

J

x	y
2	−1
2	−2
2	−3
2	−4

STAAR 2017

A.12A – 1 (S) **three Y**

38 Which table does NOT show y as a function of x?

F

x	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{2}$
y	9	11	9	14	7

G

x	14	15	16	17	18
y	100	80	110	100	90

H

x	−0.2	0.6	−1.3	1.0	−0.2
y	5.8	−3.7	4.4	−0.9	8.1

J

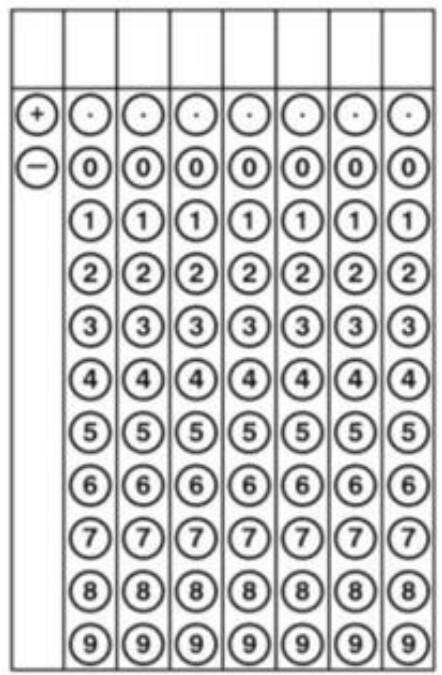
x	−24	21	24	−27	29
y	2.7	2.8	2.7	2.5	2.5

STAAR 2016

A.12B – 1 (S) one

27 Given $f(x) = 6(1 - x)$, what is the value of $f(-8)$?

Record your answer and fill in the bubbles on your answer document.



STAAR 2017

A.12B – 1 (S) **three Z**

47 If $p(x) = 5(x^2 + 1) + 16$, what is the value of $p(11)$?

A 690

B 736

C 622

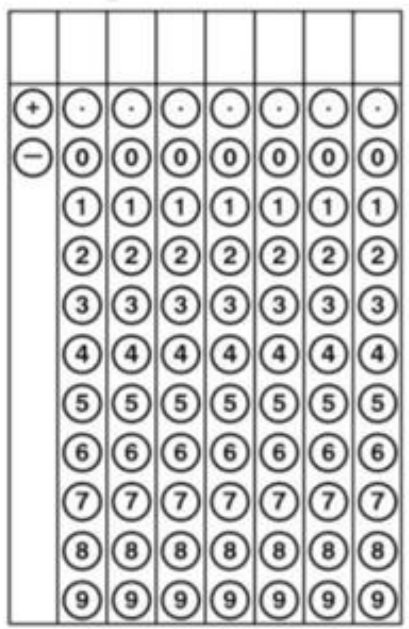
D 626

STAAR 2018

A.12B – 1 (S) **one**

20 Given $f(x) = \frac{1}{3}(4-x)^2$, what is the value of $f(16)$?

Record your answer and fill in the bubbles on your answer document.



STAAR 2017

A.12C – 1 (S) **three W**

22 A sequence can be generated by using $a_n = 4a_{(n-1)}$, where $a_1 = 6$ and n is a whole number greater than 1. What are the first four terms in the sequence?

F 6, 24, 96, 384

G 6, 10, 14, 18

H 6, 20, 100, 500

J 6, 20, 76, 300

STAAR 2018

A.12D – 1 (S) one Y

9 In a sequence of numbers, $a_3 = 0$, $a_4 = 6$, $a_5 = 12$, $a_6 = 18$, and $a_7 = 24$. Based on this information, which equation can be used to find the n^{th} term in the sequence, a_n?

A $a_n = -6n + 18$

B $a_n = -18n + 6$

C $a_n = 6n - 18$

D $a_n = 18n - 6$

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A.12E – 1 (S) one Z

18 Which of the following is equivalent to $3x - 4y = 6$?

F $y = -\frac{6}{7}x$

G $y = -\frac{3}{4}x$

H $y = \frac{4}{3}x + 2$

J $y = \frac{3}{4}x - \frac{3}{2}$