2014 TEXAS STAAR TEST – END OF COURSE – ALGEBRA I

Total Possible Score: 54
Needed Correct to Pass: 20
Advanced Performance: 42

Time Limit: 4 Hours

This file contains the State of Texas Assessments of Academic Readiness administered in Spring, 2014, along with the answer key, learning objectives, and, for writing tests, the scoring guide. This document is available to the public under Texas state law. This file was created from information released by the Texas Education Agency, which is the state agency that develops and administers the tests. All of this information appears on the Texas Education Agency web site, but has been compiled here into one package for each grade and subject, rather than having to download pieces from various web pages.

The number of correct answers required to "pass" this test is shown above. Because of where the "passing" score is set, it may be possible to pass the test without learning some important areas of study. Because of this, I believe that making the passing grade should not be considered "good enough." A student's goal should be to master each of the objectives covered by the test. The "Advanced Performance" score is a good goal for mastery of all the objectives.

The test in this file may differ somewhat in appearance from the printed version, due to formatting limitations. Since STAAR questions are changed each year, some proposed questions for future tests are included in each year's exams in order to evaluate the questions. Questions being evaluated for future tests do not count toward a student's score. Those questions are also not included in the version of the test made available to the public until after they used as part of the official test.

Questions and comments about the tests should be directed to:
Texas Education Agency
Student Assessment Division
1701 N. Congress Ave, Room 3-122A
Austin, Texas 78701
phone: 512-463-9536
email: Student.Assessment@tea.state.tx.us

Hard copies of the released tests (including Braille) may be ordered online through Pearson Education at http://www.texasassessment.com/publications/ or by calling 866-447-3577.

When printing released questions for mathematics, make sure the Print Menu is set to print the pages at 100% to ensure that the art reflects the intended measurements.

For comments and questions about this file or the web site, you can e-mail me at scott@scotthochberg.com. Please direct any questions about the content of the test to the Texas Education Agency at the address above. To download additional tests, go to www.scotthochberg.com.

STAAR®

State of Texas Assessments of Academic Readiness

Algebra I

Administered May 2014

RELEASED

STAAR ALGEBRA I REFERENCE MATERIALS

GENERAL FORMULAS

Slope of a line	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Pythagorean theorem	$a^2 + b^2 = c^2$
Quadratic formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

FORMS OF LINEAR EQUATIONS

Slope-intercept form	$y = mx + b$
Point-slope form	$y - y_1 = m(x - x_1)$
Standard form	$Ax + By = C$

STAAR ALGEBRA I REFERENCE MATERIALS

CIRCUMFERENCE			
Circle	$C = 2\pi r$	or	$C = \pi d$

AREA	
Triangle	$A = \frac{1}{2}bh$
Rectangle or parallelogram	$A = bh$
Rhombus	$A = \frac{1}{2}d_1d_2$
Trapezoid	$A = \frac{1}{2}(b_1 + b_2)h$
Regular polygon	$A = \frac{1}{2}aP$
Circle	$A = \pi r^2$

SURFACE AREA	Lateral	Total
Prism	$S = Ph$	$S = Ph + 2B$
Pyramid	$S = \frac{1}{2}Pl$	$S = \frac{1}{2}Pl + B$
Cylinder	$S = 2\pi rh$	$S = 2\pi rh + 2\pi r^2$
Cone	$S = \pi rl$	$S = \pi rl + \pi r^2$
Sphere		$S = 4\pi r^2$

VOLUME	
Prism or cylinder	$V = Bh$
Pyramid or cone	$V = \frac{1}{3}Bh$
Sphere	$V = \frac{4}{3}\pi r^3$

Algebra I

DIRECTIONS
Read each question carefully. For a multiple-choice question, determine the best answer to the question from the four answer choices provided. For a griddable question, determine the best answer to the question. Then fill in the answer on your answer document.

1 Which situation can be represented by $y = 12x - 4$?

A The number of eggs, y, in x dozen eggs for sale after 4 dozen eggs are sold

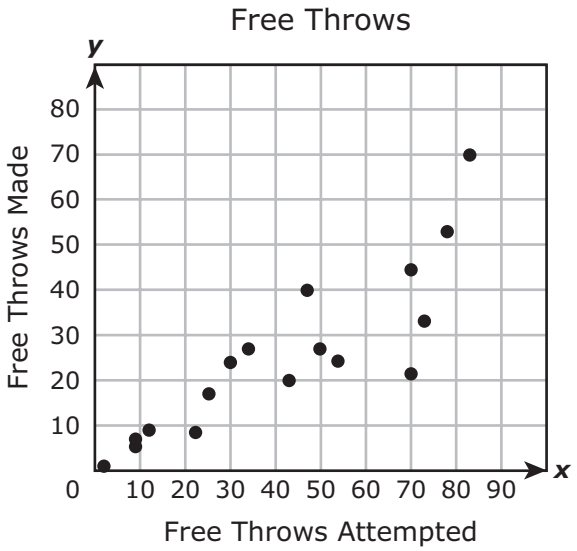
B The cost, y, of buying x movie tickets that sell for $8 each

C The cost, y, after a $4 discount, of buying x T-shirts that sell for $12 each

D The number of inches, y, in an x-foot-tall tree after cutting off 4 feet

---

2 The scatterplot shows the number of free throws that different basketball players attempted and the number that each player made.



Based on the trend in the data, approximately how many free throws would a player be expected to make if he attempted 60 free throws?

F 50

G 35

H 25

J 60

GO ON

3 Which table shows the same rate of change of y with respect to x as $y = 4 - \frac{5}{8}x$?

A

x	y
−3	−12
−1	−4
2	8
5	20

B

x	y
−4	10.4
2	0.8
4	−2.4
8	−8.8

C

x	y
−4	6.5
2	2.75
4	1.5
8	−1

D

x	y
−3	12
−1	4
2	−8
5	−20

---

4 A teacher will determine the total number of books to order for a class using the function $b(n) = 4n$, where n represents the number of students in the class. What is the independent quantity in this situation?

F The number of students in the class

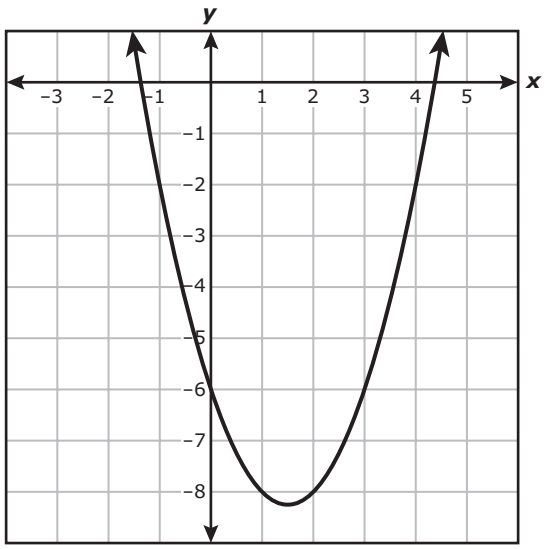
G The total number of books to order

H The number of books each student needs

J Not here

GO ON

5 The graph of quadratic function g is shown below.



Based on the graph, between which two values of x is a zero of g located?

A −9 and −8

B 1 and 2

C −7 and −5

D 4 and 5

---

6 A college student needs 11 classes that are worth a total of 40 credits in order to complete her degree. The college offers both 4-credit classes and 3-credit classes. Which system of equations can be used to determine f, the number of 4-credit classes the student can take to complete her degree, and h, the number of 3-credit classes?

F $f + h = 40$
$4h + 3f = 11$

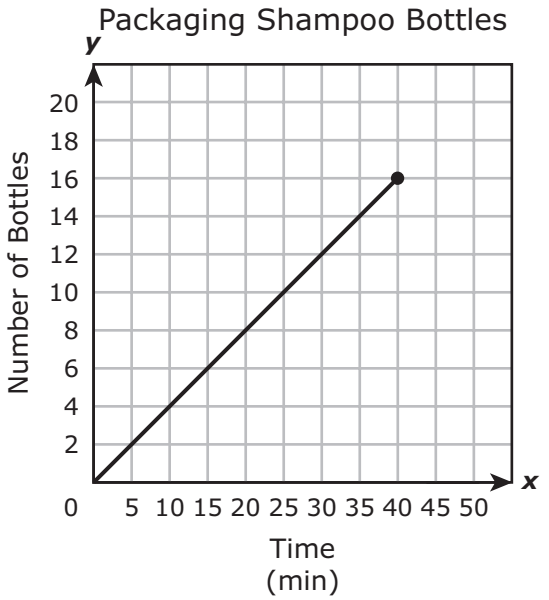
G $f + h = 11$
$4h + 3f = 40$

H $f + h = 40$
$4f + 3h = 11$

J $f + h = 11$
$4f + 3h = 40$

GO ON

7 The graph shows the time it took a worker to package 16 bottles of shampoo.



The next day two workers packaged twice the number of bottles of shampoo in the same amount of time. If this new relationship is graphed on the same coordinate grid, which statement is true?

A The new graph would have a *y*-intercept at 80.

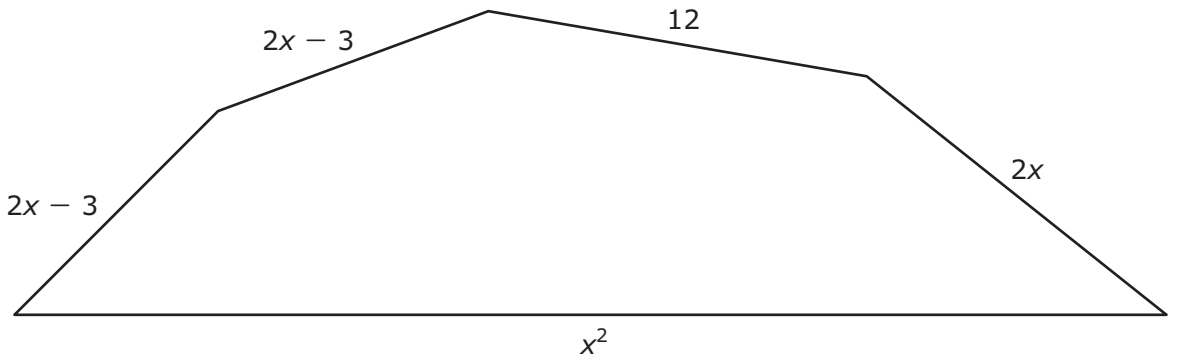
B The new graph would be steeper than the original graph.

C The new graph would be less steep than the original graph.

D The new graph would have a *y*-intercept at 8.

GO ON

8 The side lengths of the figure below are given in centimeters.



If the perimeter of this figure is 78 cm, what is the value of x?

F -12

G -6

H 6

J 12

---

9 One type of redwood tree has an average height of 65 feet when it is 20 years old. If the tree is more than 20 years old, the average height, h, can be modeled by the function $h = 1.95(a - 20) + 65$, where a is the age of the tree in years. Which statement about this situation is true?

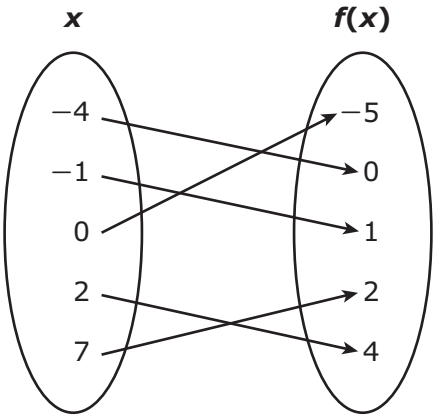
A Every additional 1.95 ft of length over 20 ft adds 45 years to the age of this type of redwood tree.

B For this type of redwood tree, the average height increases by 1.95 ft per year throughout its lifetime.

C Each additional year of age over 20 years adds 1.95 ft to the average height of this type of redwood tree.

D For this type of redwood tree, the average height increases by 65 ft for every 20 years of growth.

10 The mapping below represents all of the points on the graph of function f.



What is the domain of f?

F $\{-4, -1, 0, 2, 7\}$

G $\{-5, -4, -1, 0, 1, 2, 4, 7\}$

H $\{-5, 0, 1, 2, 4\}$

J $\{5\}$

---

11 What is the value of x in the solution to the system of equations below?

$$15x - 12y = 13$$
$$30x + 9y = 4$$

A $-\frac{17}{3}$

B $\frac{1}{3}$

C $-\frac{2}{3}$

D $\frac{1}{6}$

GO ON

12 The length, in feet, of a small train at an amusement park can be modeled by the function $f(c) = 9c + 14$, where c is the number of passenger cars attached to the locomotive. The original passenger cars were replaced, and the length of the train is now modeled by the function $h(c) = 12c + 14$. Based on this information, which statement describes the change in this situation?

F The locomotive is now 9 feet long, and the length of each passenger car remained the same.

G The locomotive is now 12 feet long, and the length of each passenger car remained the same.

H Each passenger car is now 9 feet long, and the length of the locomotive remained the same.

J Each passenger car is now 12 feet long, and the length of the locomotive remained the same.

---

13 The table of values for quadratic function g is shown below.

x	$g(x)$
−3	48
−2	30
−1	16
0	6
2	−2
3	0
4	6
6	30

If 1 is a solution to $g(x) = 0$, what is the other solution?

A −1

B 3

C 6

D −2

GO ON

14 A student bought concert tickets online. The total cost, c, in dollars, of t tickets can be found using the function below.

$$c = 24.50t + 9.50$$

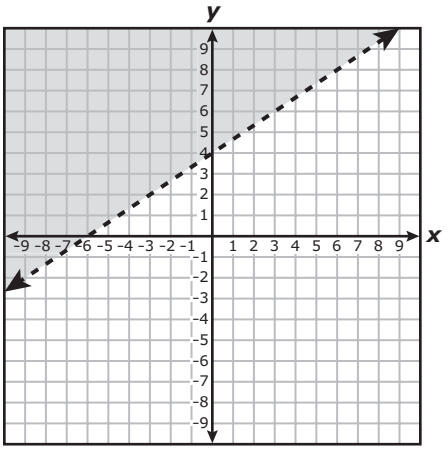
If the student spent a total of $83 on tickets, how many tickets did he buy?

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

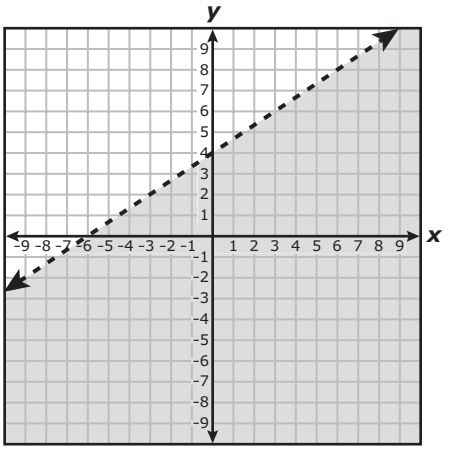
---

15 Which graph represents the inequality $-2x + 3y > 12$?

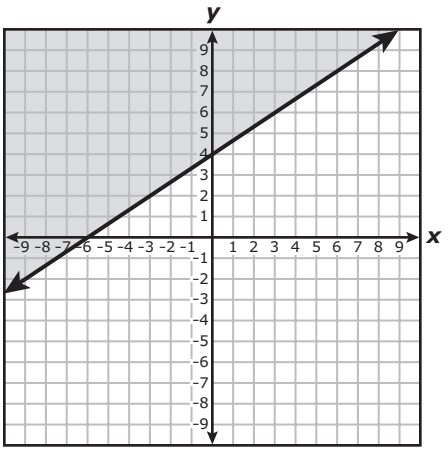
A



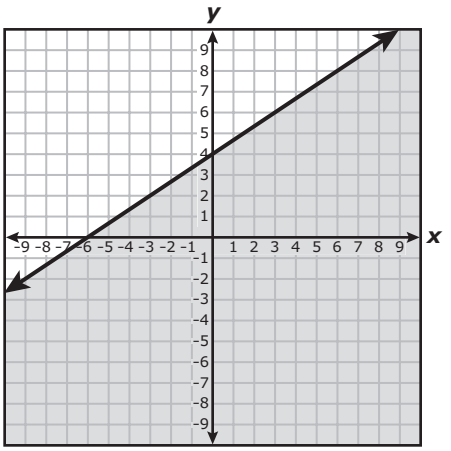
C



B



D



16 Which statement about the quadratic parent function is true?

F Its graph is symmetrical about the *x*-axis.

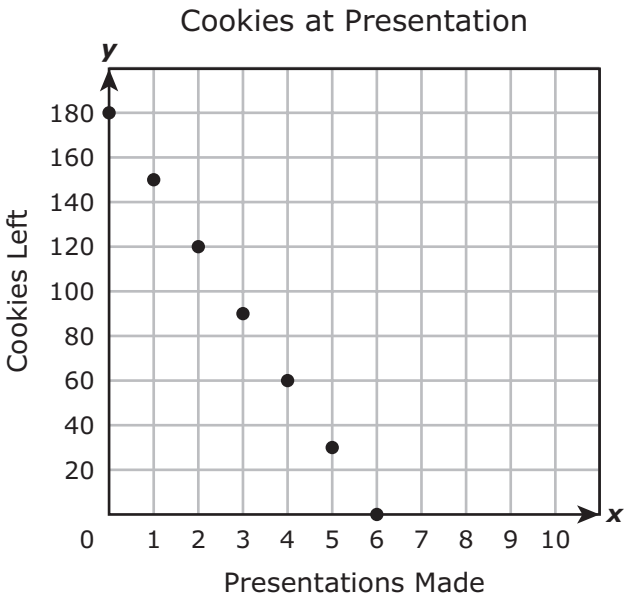
G Its graph is symmetrical about the *y*-axis.

H Its domain is the set of all non-negative numbers.

J Its range is the set of all real numbers.

---

17 The graph shows the relationship between the number of cookies a presenter at a convention had left to give away and the number of presentations she had made.



What does the *x*-intercept of the graph represent?

A The number of cookies the presenter had before making any presentations

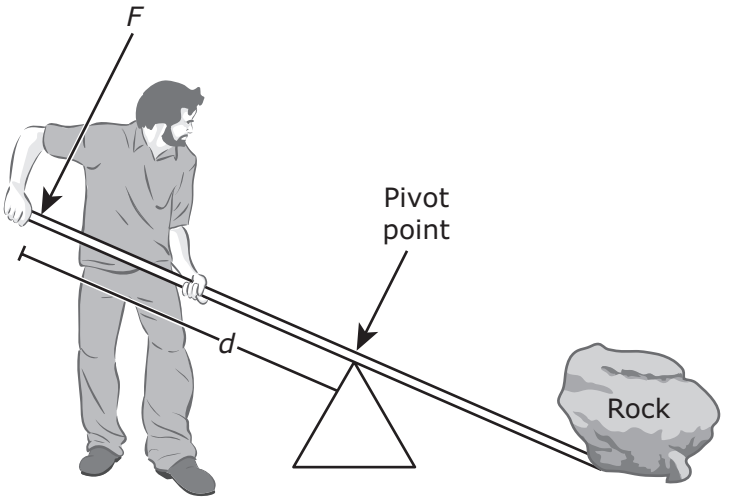
B The maximum number of cookies the presenter gave away during every presentation

C The number of presentations the presenter made per hour

D The maximum number of presentations the presenter made before running out of cookies

GO ON

18 A farmer uses a lever to move a large rock. The force required to move the rock varies inversely with the distance from the pivot point to the point the force is applied. A force of 50 pounds applied to the lever 36 inches from the pivot point of the lever will move the rock. Which function models the relationship between F, the amount of force applied to the lever, and d, the distance of the applied force from the pivot point?



F $d = \dfrac{F}{1{,}800}$

G $d = \dfrac{86}{F}$

H $F = \dfrac{1{,}800}{d}$

J $F = \dfrac{d}{86}$

---

19 Which set of ordered pairs represents y as a function of x?

A $\{(-9, 2), (0, 6), (1, -2), (-3, 6)\}$

B $\{(-1, 0), (4, 3), (-7, -3), (-1, -8)\}$

C $\{(3, 2), (-4, -2), (3, 1), (-4, 1)\}$

D $\{(5, 4), (2, 3), (1, 1), (2, 4)\}$

GO ON

20 There are 156 laptops and desktop computers in a lab. There are 8 more laptops than desktop computers. What is the total number of laptops in the lab?

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

---

21 Which statement about the quadratic functions below is false?

$$f(x) = -\frac{3}{4}x^2 + 6$$

$$g(x) = -2x^2 - 5$$

$$h(x) = \frac{1}{4}x^2 + 1$$

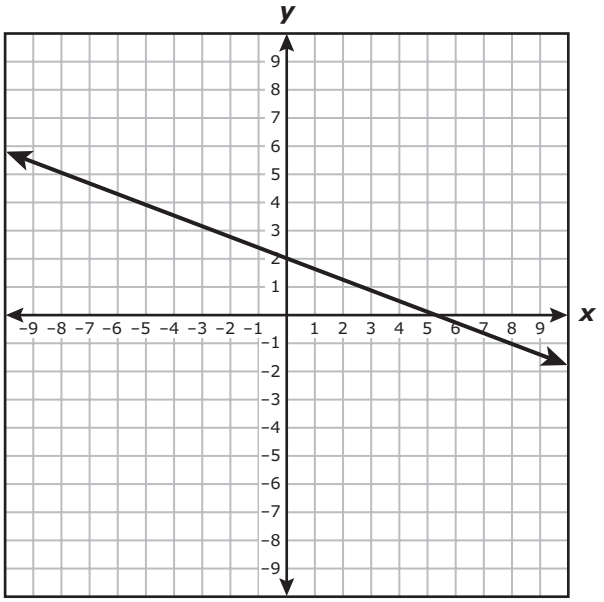
A The graphs of two of these functions have a minimum point.

B The graphs of all these functions have the same axis of symmetry.

C The graphs of two of these functions do not cross the x-axis.

D The graphs of all these functions have different y-intercepts.

22 Which equation can be represented by the graph shown below?



F $-3x + 8y + 16 = 0$

G $3x - 8y + 16 = 0$

H $-3x - 8y - 16 = 0$

J $3x + 8y - 16 = 0$

---

23 The first five terms in a pattern are shown below.

$$-0.5, -0.25, 0, 0.25, 0.5, \ldots$$

If the pattern continues, which expression can be used to find the nth term?

A $0.75n - 1.25$

B $-0.25n - 0.25$

C $0.25n - 0.75$

D $-0.5n + 0.25$

GO ON

24 What are the solutions to the equation $x^2 - 4x = -1$?

F $x = \dfrac{-4 \pm \sqrt{20}}{2}$

G $x = \dfrac{4 \pm \sqrt{12}}{2}$

H $x = \dfrac{-4 \pm \sqrt{12}}{2}$

J $x = \dfrac{4 \pm \sqrt{20}}{2}$

---

25 Which inequality is equivalent to $-3x + 2y > 5y + 9$?

A $y > x + 3$

B $y > -x - 3$

C $y < x - 3$

D $y < -x - 3$

GO ON

26 The approximate distance in miles between Los Angeles and a commercial jet flying from Boston to Los Angeles can be found using the function $m = -475t + 2{,}650$, where t is the number of hours the jet has been flying. Which number of hours and minutes is closest to the amount of time that the jet has been flying if the jet is 1,500 miles from Los Angeles?

F 2 hours and 25 minutes

G 8 hours and 44 minutes

H 3 hours and 16 minutes

J 9 hours and 13 minutes

---

27 The total cost of renting a banquet hall is a function of the number of hours the hall is rented. The owner of the banquet hall charges $85 per half hour up to a maximum of 4 hours plus a $50 cleaning fee. What is the greatest value in the range for this situation?

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

GO ON

28 The number of possible pairings of 2 objects selected from a set of x objects can be modeled by $p(x) = 0.5x(x - 1)$. Which table shows this quadratic relationship?

F

Objects

Number of Objects, x	Possible Pairings, $p(x)$
2	1
4	6
9	28
13	78

H

Objects

Number of Objects, x	Possible Pairings, $p(x)$
2	1
3	3
7	22
13	78

G

Objects

Number of Objects, x	Possible Pairings, $p(x)$
2	1
5	10
8	28
12	66

J

Objects

Number of Objects, x	Possible Pairings, $p(x)$
2	1
4	6
10	44
12	66

---

29 Two functions are given below.

$$f(x) = -4x + 1$$
$$g(x) = -4x + \frac{1}{2}$$

How does the graph of f compare with the graph of g?

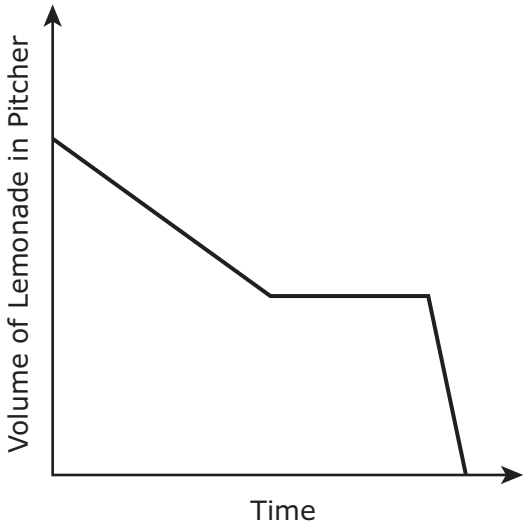
A The graph of f is less steep than the graph of g.

B The graph of f has the same y-intercept as the graph of g.

C The graph of f is parallel to the graph of g.

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

30 Which situation is represented by the graph below?



F A man poured lemonade from a full pitcher at a constant rate. Then for several seconds, he stopped pouring from the pitcher. Then the man poured the rest of the lemonade from the pitcher at a faster rate than before.

G A boy poured lemonade into an empty pitcher. Then for several seconds, he stopped pouring into the pitcher. Then the boy poured more lemonade into the pitcher at a slower rate than before.

H A woman poured lemonade from a full pitcher at a constant rate. Then for several seconds, she stopped pouring from the pitcher. Then the woman poured the rest of the lemonade from the pitcher at a slower rate than before.

J A girl poured lemonade into an empty pitcher. Then for several seconds, she stopped pouring into the pitcher. Then the girl poured more lemonade into the pitcher at a faster rate than before.

---

31 The measure of an obtuse angle is represented by $(9x + 27)°$. Which is not a possible value for x?

A 7.1

B 12.3

C 16.9

D 6.8

GO ON

32 An online music service lets customers download an unlimited number of songs for \$0.25 each after paying a monthly membership fee of \$5.00. The total amount of money a customer spends on music in dollars in a single month can be found using the function $y = 0.25x + 5$. What does the variable x represent in this function?

F The total amount of money the customer spends on music each month

G The number of songs the customer downloads each month

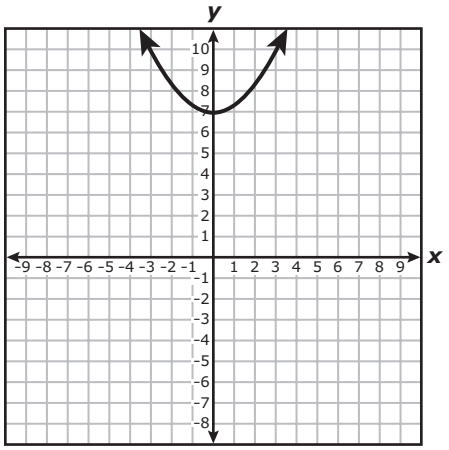
H The number of customers that use the music service

J The cost of downloading one song

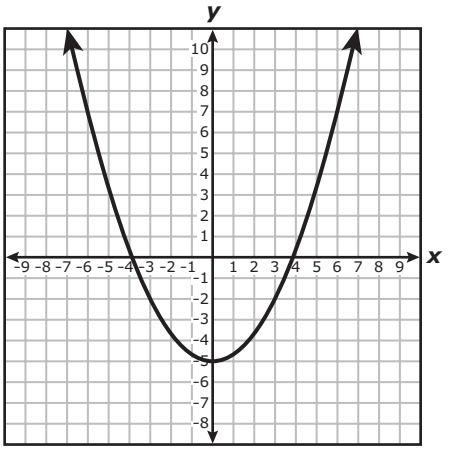
---

33 Which graph can be obtained by translating the graph of $h(x) = 0.33x^2 + 2$ down 7 units?

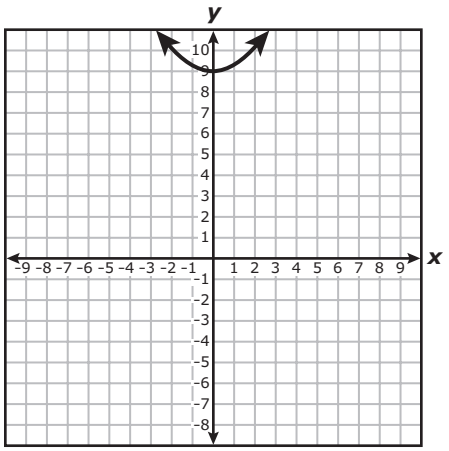
A



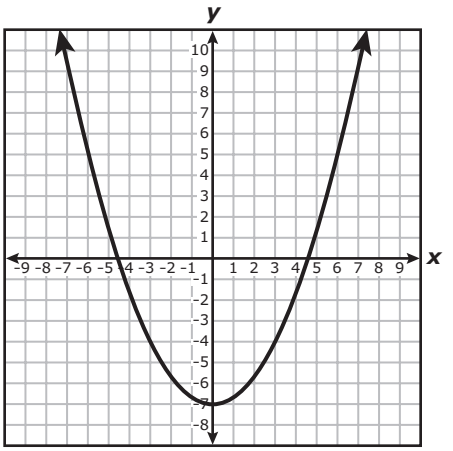
C



B



D

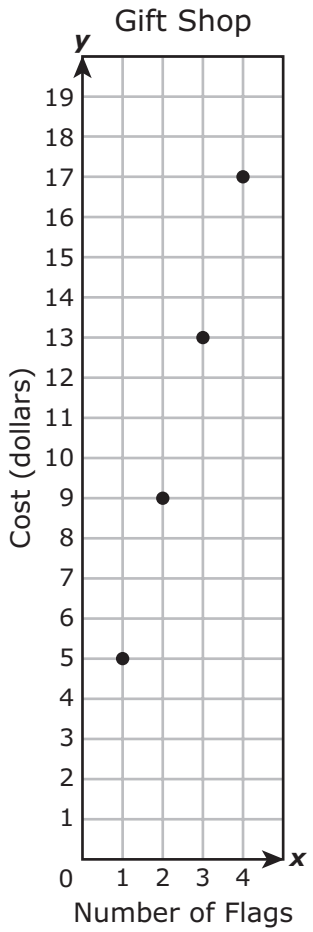


GO ON

34 The mass of a substance varies directly with the volume of the substance. The volume of 100 kilograms of the substance is 80 liters. What is the volume, in liters, of 3.2 kilograms of this substance?

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

35 The graph shows the cost of purchasing *x* small flags at a gift shop if the flags are equally priced.



Based on this information, which ordered pair represents an additional point on the graph?

A (5, 19)

B (8, 34)

C (6, 24)

D (7, 29)

GO ON

36 The table shows the functions used to determine the number of points earned every month by regular and elite members of a dining club who spend d dollars that month at participating restaurants.

Dining Club Points

Member Status	Points Earned
Regular	$r = 5d + 100$
Elite	$e = 8d + 200$

Which statement describes the difference in these situations?

F Regular members earn 3 more points for every dollar spent and are automatically awarded 100 more points per month than elite members.

G Regular members earn 3 more points for every dollar spent and are automatically awarded 200 more points per month than elite members.

H Elite members earn 3 more points for every dollar spent and are automatically awarded 100 more points per month than regular members.

J Elite members earn 3 more points for every dollar spent and are automatically awarded 200 more points per month than regular members.

---

37 Which of the following describes all the solutions to the inequality $5x + 7y \geq 22$ when $y = -4$?

A $x \leq 10$

B $x \leq -10$

C $x \geq 10$

D $x \geq -10$

GO ON

38 The table shows the playing time in minutes of high-definition videos and the file size of these videos in megabytes (MB).

Videos

Playing Time, x (min)	File Size, y (MB)
0.5	60
1.5	180
2	240
4.5	540
5	600

What does the slope of the graph of this situation represent?

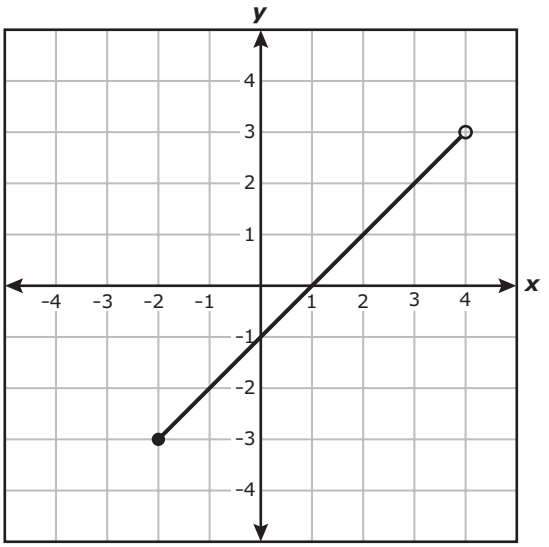
F The increase in the file size of the video per minute of playing time

G The file size of each video

H The playing time of each video

J The increase in the playing time per MB of video

39 Function f is graphed below.



What is the range of f?

A $\{x \mid -2 \leq x < 4\}$

B $\{x \mid -2 < x \leq 4\}$

C $\{y \mid -3 < y \leq 3\}$

D $\{y \mid -3 \leq y < 3\}$

---

40 Which statement about the quadratic equation below is true?

$$-4.5x^2 + 72 = 0$$

F The equation has $x = 4$ as its only solution.

G The equation has no real solutions.

H The equation has $x = 4$ and $x = -4$ as its only solutions.

J The equation has an infinite number of solutions.

GO ON

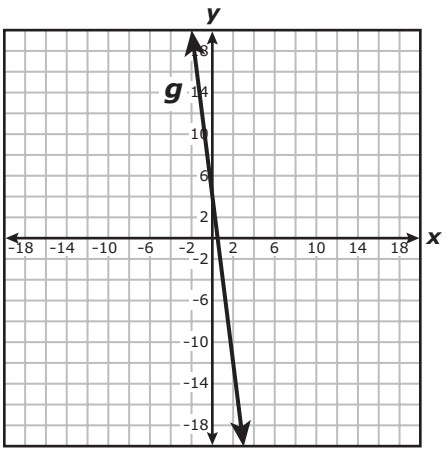
41 Which representation shows the same relationship as $g(x) = \frac{4}{3}(6x + 3)$?

A

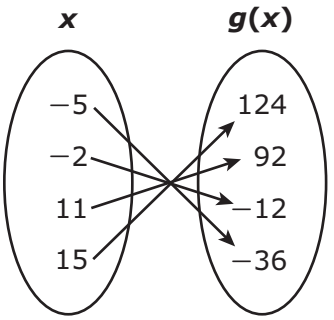
x	$g(x)$
28	3
12	1
−20	−3
−36	−5

B $g = \{(13, 108), (10, 94), (4, 36), (-3, -20)\}$

C



D



GO ON

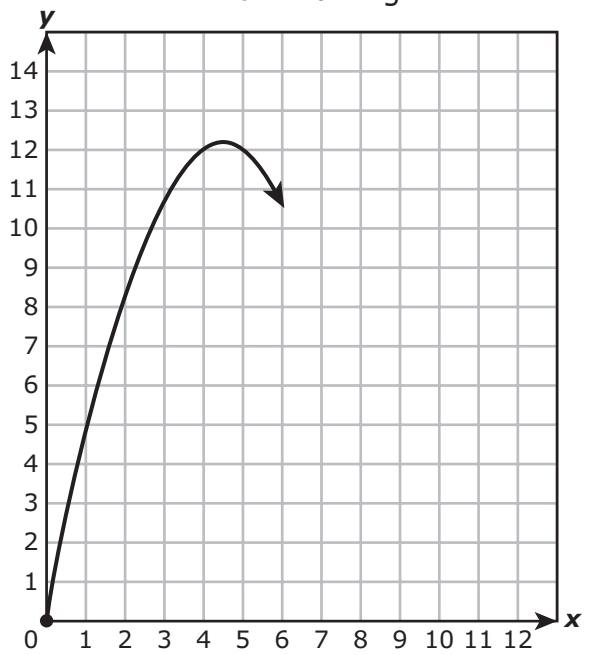
42 If $f(x) = \frac{2}{3}x^2 + 8x$, what is the value of $f(6)$?

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

---

43 An architecture student is drawing a graph of an arch. As shown below, the arch has the shape of a parabola that begins at the origin and has a vertex at (4.6, 12.2).

Arch Drawing



Other than the origin, at which point will the graph intersect the x-axis?

A (12.2, 0)

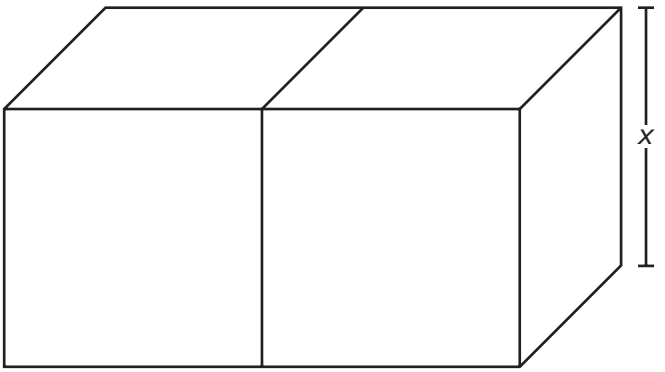
B (9.2, 0)

C (4.6, 0)

D (10.6, 0)

GO ON

44 The volume of two identical cubes is related to the edge length of the cubes.



Which function represents the combined volume of these cubes?

F $y = 2x^3$

G $y = x^3$

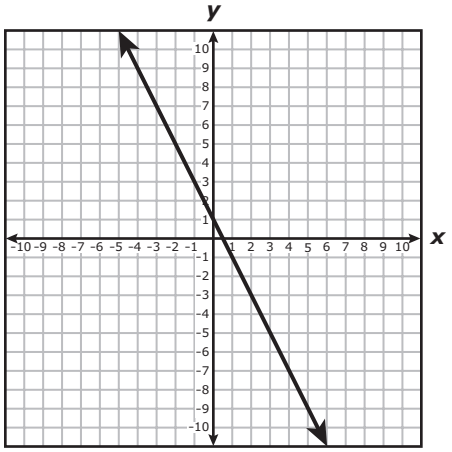
H $y = 8x^3$

J $y = 2x^2$

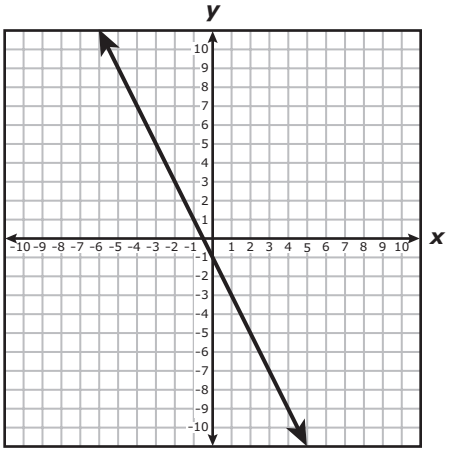
GO ON

45 The slope and y-intercept of the line represented by $y = \frac{2}{5}x + \frac{3}{15}$ are both divided by $-\frac{1}{5}$ to create a new line. Which graph represents the new line?

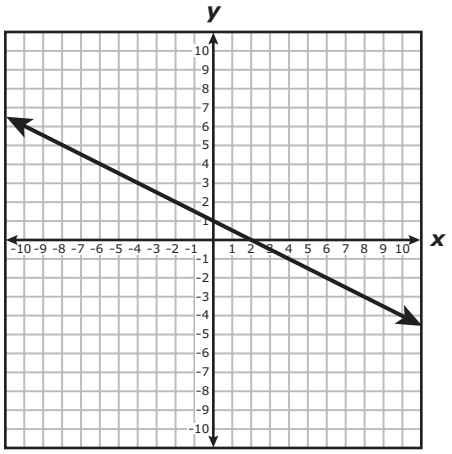
A



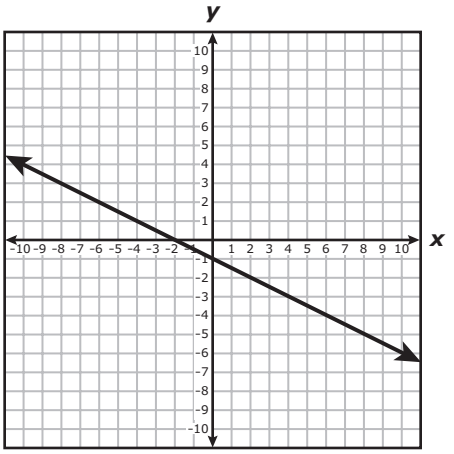
C



B



D



GO ON

46 A boy has 380 prize tickets he wants to exchange for action figures at a prize booth. At this prize booth 5 tickets can be exchanged for a large action figure, and 7 tickets can be exchanged for 2 small action figures. The boy wants 4 times as many small action figures as large action figures. Based on this information, can the boy get 80 small action figures?

F No, because he would not have enough tickets for 20 large action figures

G Yes, because he would still have enough tickets for 320 large action figures

H No, because he would not have enough tickets for 320 large action figures

J Yes, because he would still have enough tickets for 20 large action figures

---

47 Which expression is equivalent to $3c\left(\frac{1}{3}d - 9\right) - 7(c + 1) + d(c + 4)$?

A $2cd - 34c + 4d - 7$

B $2cd - 7c - 4$

C $2cd + 34c + 4d + 7$

D $2cd + 8c + 4$

GO ON

48 What is the equation of the line that has a slope of 0 and passes through the point $(6, -8)$?

F $x = 6$

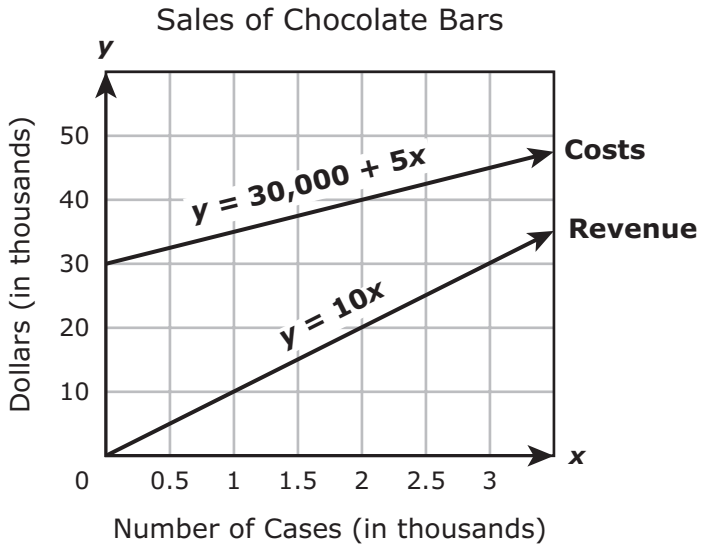
G $y = 6$

H $x = -8$

J $y = -8$

---

49 A candy company sells cases of chocolate bars. The company has fixed costs of $30,000, and each case of chocolate bars costs an additional $5 to make. The company sells each case for $10. The graph of a system of linear equations representing this company's costs and revenue for manufacturing and selling x cases of chocolate bars is shown below.



How many cases of chocolate bars will this company need to sell in order for costs and revenue to be equal?

A 3,500

B 6,000

C 35,000

D 60,000

GO ON

50 Which expression is equivalent to $\frac{z^a \cdot z^b}{z^c}$?

F $z^{(a-b-c)}$

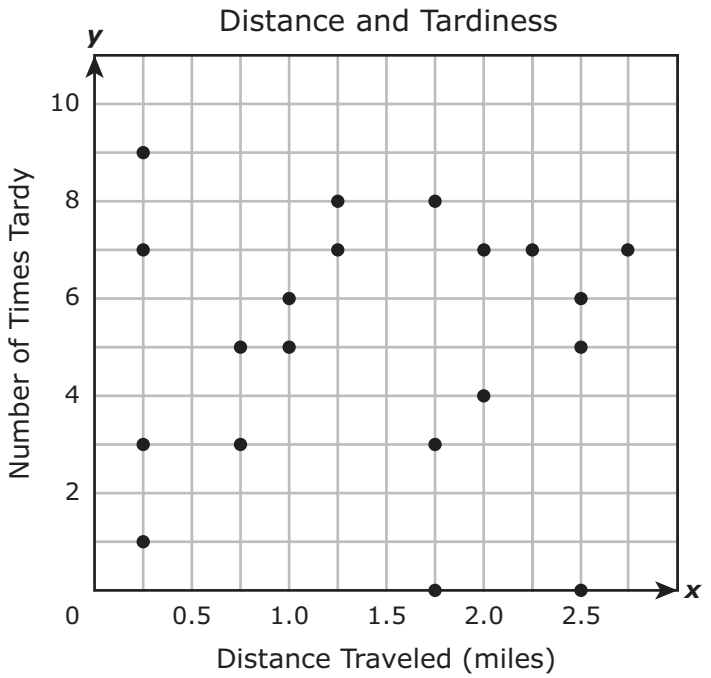
G $z^{(a-b+c)}$

H $z^{(a+b-c)}$

J $z^{(a+b+c)}$

GO ON

51 The scatterplot shows the relationship between the distance that students traveled to get to school and the number of times those students were tardy during the school year.



The principal of the school wants to use this information to help him determine if there is a correlation between distance traveled and the number of times tardy. Which statement is a reasonable conclusion that the principal could make?

A A student who travels 1.5 miles to get to school will be tardy 9 times during the school year.

B A student who travels more than 3 miles to get to school will be tardy at least 7 times during the school year.

C There is no correlation between the distance a student travels to get to school and the number of times the student will be tardy during the school year.

D There is a nonlinear correlation between the distance a student travels to get to school and the number of times the student will be tardy during the school year.

GO ON

52 A tennis player broke the old record for the most matches won in a tournament by at least 2 matches. Which inequality can be used to find all possible values of t, the number of matches the player won, in terms of r, the old record?

F $t \leq r - 2$

G $t \geq 2r$

H $t \leq \frac{r}{2}$

J $t \geq r + 2$

---

53 The cost of staying at a hotel can be found using the function $y = 129x + 9.95$, where x is the number of days a guest stays at the hotel and y is the cost in dollars. The cost includes a flat fee for Internet access. If the fee for Internet access is not included, which statement is true?

A The cost is \$9.95 less per day.

B The cost is \$9.95 less.

C The cost is \$9.95 more per day.

D The cost is \$9.95 more.

54 The table shows the population, p, of mice in a field at the end of m months.

Mouse Population

Time, m (months)	Population, p
0	6
1	12
2	24
3	48
4	96

Based on the data in the table, what will be the population of mice in the field at the end of 8 months?

F 192

G 3,072

H 1,536

J 256

BE SURE YOU HAVE RECORDED ALL OF YOUR ANSWERS ON THE ANSWER DOCUMENT.

STOP

STAAR
Algebra I
May 2014

TX866211 1 2 3 4 5 A B C D E Printed in the USA DPSS/ISD7194

Item Number	Reporting Category	Readiness or Supporting	Content Student Expectation	Correct Answer
1	3	Readiness	A.5(C)	C
2	2	Readiness	A.2(D)	G
3	3	Supporting	A.6(A)	C
4	1	Supporting	A.1(A)	F
5	5	Supporting	A.10(B)	D
6	4	Supporting	A.8(A)	J
7	3	Readiness	A.6(C)	B
8	2	Readiness	A.4(A)	H
9	1	Readiness	A.1(E)	C
10	2	Readiness	A.2(B)	F
11	4	Readiness	A.8(B)	B
12	3	Readiness	A.6(F)	J
13	5	Readiness	A.10(A)	B
14	4	Readiness	A.7(B)	3
15	1	Readiness	A.1(D)	A
16	2	Supporting	A.2(A)	G
17	3	Readiness	A.6(B)	D
18	5	Supporting	A.11(B)	H
19	1	Supporting	A.1(B)	A
20	4	Readiness	A.8(B)	82
21	5	Readiness	A.9(D)	A
22	3	Readiness	A.5(C)	J
23	2	Supporting	A.3(B)	C
24	5	Readiness	A.10(A)	G
25	2	Readiness	A.4(A)	D
26	4	Readiness	A.7(B)	F
27	3	Supporting	A.5(B)	730
28	1	Readiness	A.1(D)	G
29	3	Readiness	A.6(C)	C
30	2	Supporting	A.2(C)	F
31	4	Supporting	A.7(C)	D
32	2	Supporting	A.3(A)	G
33	5	Supporting	A.9(C)	C
34	3	Supporting	A.6(G)	2.56
35	1	Readiness	A.1(E)	D
36	3	Readiness	A.6(F)	H
37	4	Readiness	A.7(B)	C
38	3	Readiness	A.6(B)	F
39	2	Readiness	A.2(B)	D
40	5	Readiness	A.10(A)	H
41	3	Readiness	A.5(C)	D
42	2	Readiness	A.4(A)	72
43	5	Readiness	A.9(D)	B
44	1	Supporting	A.1(C)	F
45	3	Readiness	A.6(C)	C
46	4	Supporting	A.8(C)	J
47	2	Supporting	A.4(B)	A
48	3	Supporting	A.6(D)	J
49	4	Readiness	A.8(B)	B
50	5	Supporting	A.11(A)	H
51	2	Readiness	A.2(D)	C
52	4	Supporting	A.7(A)	J
53	3	Readiness	A.6(F)	B
54	1	Readiness	A.1(E)	H

Algebra I Assessment

Eligible Texas Essential Knowledge and Skills

Texas Education Agency
Student Assessment Division
Fall 2010

STAAR Algebra I Assessment

Reporting Category 1:
Functional Relationships

The student will describe functional relationships in a variety of ways.

(A.1) **Foundations for functions.** The student understands that a function represents a dependence of one quantity on another and can be described in a variety of ways. The student is expected to

(A) describe independent and dependent quantities in functional relationships; ***Supporting Standard***

(B) gather and record data and use data sets to determine functional relationships between quantities; ***Supporting Standard***

(C) describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations; ***Supporting Standard***

(D) represent relationships among quantities using [concrete] models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities; and ***Readiness Standard***

(E) interpret and make decisions, predictions, and critical judgments from functional relationships. ***Readiness Standard***

Texas Education Agency
Student Assessment Division
Fall 2010

Reporting Category 2:
Properties and Attributes of Functions

The student will demonstrate an understanding of the properties and attributes of functions.

(A.2) **Foundations for functions.** The student uses the properties and attributes of functions. The student is expected to

(A) identify and sketch the general forms of linear ($y = x$) and quadratic ($y = x^2$) parent functions; ***Supporting Standard***

(B) identify mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete; ***Readiness Standard***

(C) interpret situations in terms of given graphs or create situations that fit given graphs; and ***Supporting Standard***

(D) collect and organize data, make and interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations. ***Readiness Standard***

(A.3) **Foundations for functions.** The student understands how algebra can be used to express generalizations and recognizes and uses the power of symbols to represent situations. The student is expected to

(A) use symbols to represent unknowns and variables; and ***Supporting Standard***

(B) look for patterns and represent generalizations algebraically. ***Supporting Standard***

(A.4) **Foundations for functions.** The student understands the importance of the skills required to manipulate symbols in order to solve problems and uses the necessary algebraic skills required to simplify algebraic expressions and solve equations and inequalities in problem situations. The student is expected to

(A) find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations; ***Readiness Standard***

(B) use the commutative, associative, and distributive properties to simplify algebraic expressions; and ***Supporting Standard***

(C) connect equation notation with function notation, such as $y = x + 1$ and $f(x) = x + 1$. ***Supporting Standard***

Reporting Category 3:
Linear Functions

The student will demonstrate an understanding of linear functions.

(A.5) **Linear functions.** The student understands that linear functions can be represented in different ways and translates among their various representations. The student is expected to

(A) determine whether or not given situations can be represented by linear functions; ***Supporting Standard***

(B) determine the domain and range for linear functions in given situations; and ***Supporting Standard***

(C) use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions. ***Readiness Standard***

(A.6) **Linear functions.** The student understands the meaning of the slope and intercepts of the graphs of linear functions and zeros of linear functions and interprets and describes the effects of changes in parameters of linear functions in real-world and mathematical situations. The student is expected to

(A) develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations; ***Supporting Standard***

(B) interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs; ***Readiness Standard***

(C) investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$; ***Readiness Standard***

(D) graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and y-intercept; ***Supporting Standard***

(E) determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations; ***Supporting Standard***

(F) interpret and predict the effects of changing slope and y-intercept in applied situations; and ***Readiness Standard***

(G) relate direct variation to linear functions and solve problems involving proportional change. ***Supporting Standard***

Reporting Category 4:
Linear Equations and Inequalities

The student will formulate and use linear equations and inequalities.

(A.7) **Linear functions.** The student formulates equations and inequalities based on linear functions, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to

(A) analyze situations involving linear functions and formulate linear equations or inequalities to solve problems; ***Supporting Standard***

(B) investigate methods for solving linear equations and inequalities using [concrete] models, graphs, and the properties of equality, select a method, and solve the equations and inequalities; and ***Readiness Standard***

(C) interpret and determine the reasonableness of solutions to linear equations and inequalities. ***Supporting Standard***

(A.8) **Linear functions.** The student formulates systems of linear equations from problem situations, uses a variety of methods to solve them, and analyzes the solutions in terms of the situation. The student is expected to

(A) analyze situations and formulate systems of linear equations in two unknowns to solve problems; ***Supporting Standard***

(B) solve systems of linear equations using [concrete] models, graphs, tables, and algebraic methods; and ***Readiness Standard***

(C) interpret and determine the reasonableness of solutions to systems of linear equations. ***Supporting Standard***

Reporting Category 5:
Quadratic and Other Nonlinear Functions

The student will demonstrate an understanding of quadratic and other nonlinear functions.

(A.9) **Quadratic and other nonlinear functions.** The student understands that the graphs of quadratic functions are affected by the parameters of the function and can interpret and describe the effects of changes in the parameters of quadratic functions. The student is expected to

(A) determine the domain and range for quadratic functions in given situations; ***Supporting Standard***

(B) investigate, describe, and predict the effects of changes in a on the graph of $y = ax^2 + c$; ***Supporting Standard***

(C) investigate, describe, and predict the effects of changes in c on the graph of $y = ax^2 + c$; and ***Supporting Standard***

(D) analyze graphs of quadratic functions and draw conclusions. ***Readiness Standard***

(A.10) **Quadratic and other nonlinear functions.** The student understands there is more than one way to solve a quadratic equation and solves them using appropriate methods. The student is expected to

(A) solve quadratic equations using [concrete] models, tables, graphs, and algebraic methods; and ***Readiness Standard***

(B) make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (x-intercepts) of the graph of the function. ***Supporting Standard***

(A.11) **Quadratic and other nonlinear functions.** The student understands there are situations modeled by functions that are neither linear nor quadratic and models the situations. The student is expected to

(A) use patterns to generate the laws of exponents and apply them in problem-solving situations; ***Supporting Standard***

(B) analyze data and represent situations involving inverse variation using [concrete] models, tables, graphs, or algebraic methods; and ***Supporting Standard***

(C) analyze data and represent situations involving exponential growth and decay using [concrete] models, tables, graphs, or algebraic methods. ***Supporting Standard***