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ALGEBRA I

Sample STAAR Practice Book

Example problems arranged
by the 2015-2016 Algebra I
EOC Standards

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SAMPLE

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Algebra I
Sample STAAR Problem Bank
Example problems arranged
by the 2015-2016 Algebra I
EOC Standards

Published by
mirror math Educational Services, LLC
Jacksonville, Texas
2017

Developed by
Larry Richmond and Lee Traylor

A special thanks to Shelly Jones and the teachers and administrators of Jacksonville High School in Jacksonville, Texas who piloted the mirror | math program.

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Variables, Expressions, and Equations

A.5A - Solve linear equations in one variable, including those for which the application of the distributive property is necessary and for which variables are included on both sides. **READINESS.**

1. What is the solution of the equation shown below?

$$5a + 6 - 4a = 2(a - 4)$$

Record your answer in the boxes below and fill in the corresponding bubbles.

+	·	·	·	·	·	·	·
-	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
	4	4	4	4	4	4	4
	5	5	5	5	5	5	5
	6	6	6	6	6	6	6
	7	7	7	7	7	7	7
	8	8	8	8	8	8	8
	9	9	9	9	9	9	9

2. What is the solution of the equation shown below?

$$8(x - 1) = 20 + 4x$$

Record your answer in the boxes below and fill in the corresponding bubbles.

+	·	·	·	·	·	·	·
-	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
	4	4	4	4	4	4	4
	5	5	5	5	5	5	5
	6	6	6	6	6	6	6
	7	7	7	7	7	7	7
	8	8	8	8	8	8	8
	9	9	9	9	9	9	9

3. What is the solution of the equation shown below?

$$6m - 3 = 5 - (m + 39.5)$$

Record your answer in the boxes below and fill in the corresponding bubbles.

+	·	·	·	·	·	·	·
-	0	0	0	0	0	0	0
	1	1	1	1	1	1	1
	2	2	2	2	2	2	2
	3	3	3	3	3	3	3
	4	4	4	4	4	4	4
	5	5	5	5	5	5	5
	6	6	6	6	6	6	6
	7	7	7	7	7	7	7
	8	8	8	8	8	8	8
	9	9	9	9	9	9	9

4. The cost of purchasing songs from a particular online service can be found by using the following equation:

$$c = 1.29d + 5.50$$

where c represents the total cost and d represents the number of songs downloaded. If Quentin spent a total of \$14.53, how many songs did he download?

- A 12
- B 6
- C 11
- D 7

11. $f(x) = 2x + 1$ and $g(x) = 5x - 3$. How does the function value for $x = 2$ compare for the two functions?

- A $f(2) > g(2)$
- B $f(2) = g(2)$
- C $f(2) < g(2)$
- D Cannot be determined.

12. Let $f(x) = \sqrt{x}$. For which of the following domain elements is $f(x) = 2$?

- A 1
- B 2
- C 3
- D 4

13. For function h , $h(-4) = 9$, $h(1) = 6$, $h(3) = 2$, and $h(0) = 7$. Which of the following sets contain only domain elements?

- A $\{-4, 9, 1\}$
- B $\{-4, 0, 1\}$
- C $\{9, 6, 7\}$
- D $\{3, 9, 1\}$

14. For function g , $g(0) = 1$, and $g(1) = 5$. Assuming g is a linear function, what is $g(3)$?

Record your answer in the boxes below and fill in the corresponding bubbles.

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

15. For function h , $h(3) = -11$, and $h(0) = 5$. Assuming h is a quadratic function, what is $h(4)$?

- A -19
- B 13
- C 10
- D Cannot be determined.

Slope as a Rate-of-Change

A.3A - Determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including $y = mx + b$, $Ax + By = C$, and $y - y_1 = m(x - x_1)$. SUPPORTING.

1. What is the slope of the line represented by the equation $4x + 3y = 20$?

A 4
B 3
C $\frac{-4}{3}$
D 5

2. What is the slope of the line passing through the points $(4, 3)$ and $(5, -2)$?

A 5
B -5
C $\frac{-1}{5}$
D $\frac{1}{5}$

3. What is the slope of the line passing through the points $(4, 5)$ and $(4, -1)$?

A -6
B 6
C 0
D undefined

4. What is the slope of the line passing through the points $(-2, 5)$ and $(-1, 5)$?

A 0
B undefined
C 1
D -1

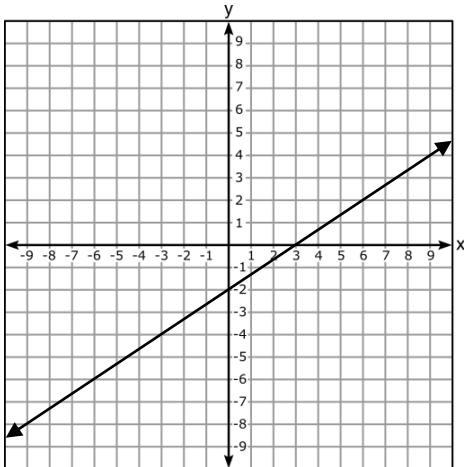
5. Consider the following table:

x	y
-3	-12
-1	-4
2	8
5	20

What is the rate of change of y with respect to x ?

A -4
B 4
C $\frac{1}{4}$
D $\frac{-1}{4}$

6. What is the slope of the line in the graph below?

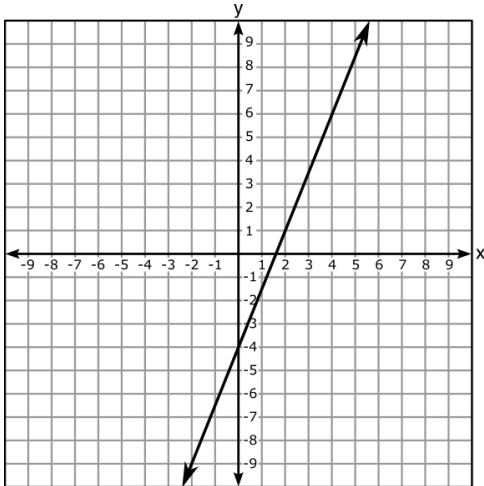


- A $\frac{3}{2}$
- B $\frac{2}{3}$
- C $\frac{-3}{2}$
- D $\frac{-2}{3}$

7. What is the slope of the line given by the equation $y - 4 = 2(x - 7)$?

- A -4
- B 2
- C -7
- D -14

8. Consider the following graph:



Which equation represents a line perpendicular to this line through the point $(5, -4)$?

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

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

C $y = -\frac{2}{5}x + 6$

D $y = \frac{2}{5}x - 6$

9. Which of the following equations represents the line through the point $(-2, 6)$ perpendicular to $y - 3 = \frac{1}{2}(x + 7)$?

A $y = \frac{1}{2}x + 5$

B $y = -2x + 10$

C $y = -2x + 2$

D $y = \frac{1}{2}x + 7$

15. Mr. Winston observed the relationship between the first semester grade and second semester grade for each of the students in his Geometry classes. The table below shows some of the resulting data.

First Semester Grade	Second Semester Grade
90	88
70	64
76	76
72	70
80	87
85	77

Which of the following shows an appropriate equation for the line of best fit?

- A $y = -2.67 + x$
- B $y = 1 - 2.67x$
- C $y = -.68 + .83x$
- D $y = .83 + .68x$

16. Ms. Loveless observed the number of absences for each of the students in her Economics classes and the final grade that each student received. The table below shows some of the resulting data.

Number of Absences	Final Grade
0	80
1	90
2	78
4	70
3	72
6	71

Which of the following shows an appropriate equation for the line of best fit?

- A $y = .56x - .75$
- B $y = -6.4x + .56$
- C $y = -.75x - 6.4$
- D $y = -2.63x + 83.84$

8. Jenny observed the shoe size of students at the elementary in her town. She also observed their performance on a particular spelling test. She observed that the correlation coefficient, r , was approximately .84. Which of the following is a reasonable conclusion based on this r -value?
- A Since r is so high, Jenny can assume that an increase in shoe size is causing an increase in spelling test scores.
 - B Since r is so high, Jenny can assume that an increase in spelling test scores is causing an increase in shoe size.
 - C Since r is so high, Jenny can assume that as shoe size increases, spelling test scores tend to increase.
 - D An r value of .84 indicates there is not a substantial correlation between the two variables.
9. Kegan collected data on the 24 members of her Algebra class. The variables observed were height, weight, and forearm length. Kegan created a scatterplot of height versus forearm length and observed that the correlation coefficient, r , was approximately .78. Which of the following is not a reasonable conclusion based on this value of r ?
- A As forearm length increases, height tends to increase.
 - B As height increases, forearm length tends to increase.
 - C Taller people tend to have longer forearms.
 - D Forearm length causes height to increase.

10. Pedro studied data from his school for the last 3 years and noted that the correlation between GPA and ACT scores was nearly 1. Which of the following conclusions are reasonable?

- I. High GPA causes high ACT scores
- II. High ACT scores cause high GPA
- III. There is a strong association between ACT scores and GPA.

- A I only.
- B II only.
- C III only
- D I and II

11. A study of fires in a large urban area was conducted. It was noted that the relationship between fire fighters present and damage done by the fires (in \$) was $r = .95$. Which of the following is a reasonable conclusion based on the value of r ?

- I. The fire fighters are causing damage to the building.
- II. Number of fire fighters and damage to the building are positively correlated.
- III. As the damage done by the fire increases, so do the number of fire fighters.

- A I and II
- B I and III
- C II and III
- D III only

Properties of Exponents

A.11B - Simplify numeric and algebraic expressions using the laws of exponents, including integral and rational exponents. *READINESS.*

1. Which expression is equivalent to

$$\frac{a^5 b^{-4} c^3}{a^3 b^7 c^4} ?$$

A $\frac{a^2}{b^{-11}c}$

B $\frac{a^2 b^{11}}{c}$

C $\frac{a^2 c}{b^{11}}$

D $\frac{a^2}{b^{11}c}$

2. Which expression is equivalent to

$$\left(\frac{a^m}{a^n}\right)^x ?$$

A $a^{x(m+n)}$

B $xa^{(m-n)}$

C $a^{x(m-n)}$

D $xa^{(m+n)}$

3. Which expression is equivalent to

$$[(x^a)(x^b)]^c ?$$

A $x^{c(a+b)}$

B $x^{c(a-b)}$

C $cx^{(a+b)}$

D $cx^{(a-b)}$

4. Which expression is equivalent to $\frac{a^{\frac{3}{2}}}{a}$?

A $\frac{1}{a^{\frac{3}{2}}}$

B \sqrt{a}

C $\frac{1}{a^{\frac{1}{2}}}$

D $a^{-\frac{1}{2}}$

A.9C - Write exponential functions in the form $f(x) = ab^x$ (where b is a rational number) to describe problems arising from mathematical and real-world situations, including growth and decay. **READINESS.**

11. Which of the following functions cannot be represented with an exponential equation in the form $y = ab^x$?

A

x	y
0	100
1	80
2	64
3	51.2

C

x	y
0	3
1	6
2	12
3	24

B

x	y
0	1
1	.9
2	.81
3	.729

D

x	y
0	3
1	7
2	11
3	15

12. Let h be an exponential function of the form $h(x) = ab^x$. If $h(0) = 10$ and $h(1) = 5$, which of the following statements is false?

- A The decay factor is .5
- B $h(3) < h(2)$
- C $h(2) = 2.5$
- D The initial value is 5

13. Let r be an exponential function of the form $r(x) = ab^x$. If $a > 1$, and $0 < b < 1$, then which of the following statements is true?

- A $r(0) < 1$
- B $r(3) > r(2)$
- C $r(0) = 1$
- D $r(4) > r(5)$

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