

Keystone Algebra I Practice Test

1. Ben is required to run 2.5 miles per day on his own for his cross country team. Plus, he has to run m miles during each of his 4 practices per week. If he has to run 32 miles in one week (7 days), which equation could be used to find m , the number of miles he has to run during each practice?

- A. $32 = 2.5m + 7(4)$
- B. $32 = 7m + 2.5(4)$
- C. $32 = 7 + 2.5 + 4m$
- D. $32 = 2.5(7) + 4m$

2. Which of the following relations is a function?

- A. $(1, 4), (-4, 2), (7, 1), (-7, 2)$
- B. $(1, 4), (-4, 6), (1, 3), (-7, 2)$
- C. $(1, 0), (-4, 3), (7, 1), (-4, 5)$
- D. $(7, 1), (-4, 4), (1, 1), (7, 2)$

3. Nancy bought some stock. The price of the stock per share at the close of each day for the first 5 days is shown below.

\$27.98 \$28.14 \$28.30 \$28.46 \$28.62

The stock price follows a pattern. Which expression can be used to determine the stock price at the close of the n^{th} day?

- A. $0.16(27.82 + n)$
- B. $27.98n$
- C. $27.82 + 0.16n$
- D. $27.98 + 0.16n$

4. Ethan Diane and sell televisions at different stores. Diane earns \$11 for each television she sells, plus a base salary of \$250 each day. Ethan earns \$26 for each television he sells, plus a base salary of \$175 each day. The system of equations shown below represents this situation on a day that Diane and Ethan both earned the same amount of money.

$$\begin{aligned}y &= 11x + 250 \\y &= 26x + 175\end{aligned}$$

Which statement is true?

- A. Diane sold 5 televisions, and Ethan sold 3 televisions.
- B. Diane and Ethan both sold 5 televisions.
- C. Diane and Ethan both sold 3 televisions.
- D. Diane sold 3 televisions, and Ethan sold 5 televisions.

5. Simplify:

$$3|10 - 4^2|^{-1}$$

- A. -18
- B. $\frac{1}{2}$
- C. $\frac{1}{18}$
- D. $-\frac{1}{2}$

6. Carrie is trying to solve the equation below.

$$1x = 3$$

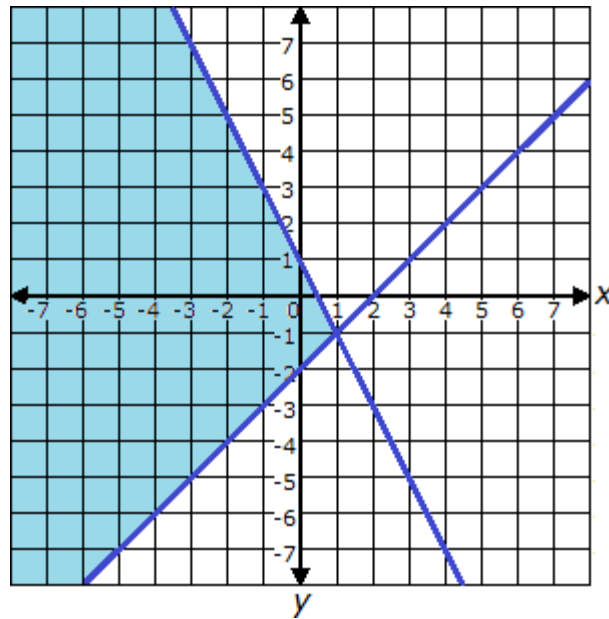
Which equation below can be derived by correctly applying the identity property to the equation above?

- A. $x = -\frac{1}{3}$
- B. $x = \frac{1}{3}$
- C. $x = -1$
- D. $x = 3$

7. A company produced 4,985 gadgets at a cost of \$2.07 each. The company sold 4,109 of the gadgets for \$14.99 each. Which is the closest estimate of the company's profit or loss?

- A. \$50,000 profit
- B. \$40,000 loss
- C. \$50,000 loss
- D. \$60,000 profit

8. The solution set of a system of inequalities is shown on the graph below.



Which system of inequalities is shown on the graph?

- A. $y \geq -2x + 1$
 $y \leq x - 2$
- B. $y \leq -2x + 1$
 $y \geq x - 2$
- C. $y \geq -2x + 1$
 $y \geq x - 2$
- D. $y \leq -2x + 1$
 $y \leq x - 2$

9. Stan ran x laps and walked y laps around the school track. It took him a total of 26 minutes. The equation below describes the relationship between the number of laps Stan ran and walked around the track.

$$2x + 5y = 26$$

The ordered pair $(3, 4)$ is a solution of the equation. What does the solution $(3, 4)$ represent?

- A. It took Stan 3 minutes to run each lap and 4 minutes to walk each lap.
- B. Stan ran 3 laps and walked 4 laps around the track.
- C. It took Stan 3 minutes to walk each lap and 4 minutes to run each lap.
- D. Stan walked 3 laps and ran 4 laps around the track.

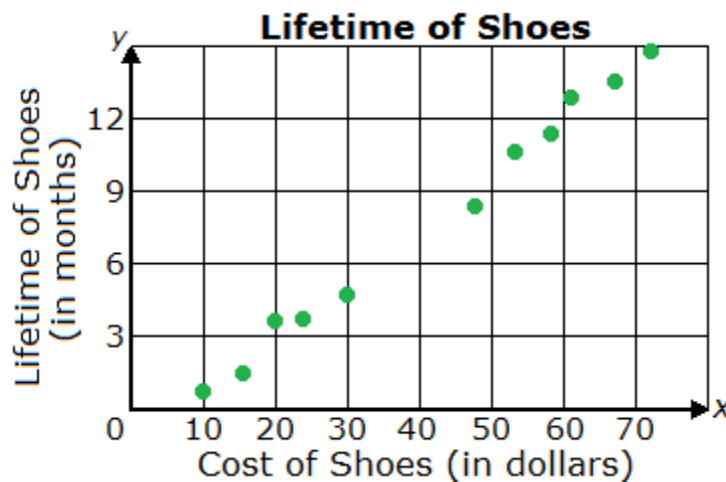
10. Two monomials are shown below.

$$6xy \quad 8x^2y^2$$

What is the least common multiple (LCM) of these monomials?

- A. $2xy$
- B. $48x^3y^3$
- C. $24x^2y^2$
- D. $16xy$

11. Victor recorded how long different pairs of shoes lasted, based on the cost of the shoes, in the scatter plot below.



Based on the line of best fit, how long would a \$40 pair of shoes last?

- A. 7.5 months
- B. 15 months
- C. 9.5 months
- D. 6 months

12. A compound inequality is shown below.

$$-2 < 6 - 4h < 2$$

What is the solution of the compound inequality?

- A. $1 > h > 2$
- B. $1 < h < 2$
- C. $-2 > h > -1$
- D. $-2 < h < -1$

13. Which expression below is equivalent to $\sqrt{48}$?

- A. $4\sqrt{3}$
- B. $4\sqrt{6}$
- C. $6\sqrt{2}$
- D. $8\sqrt{3}$

14. A system of linear equations is shown below.

$$\begin{aligned} 4x + 3y &= 8 \\ y &= 2x + 3 \end{aligned}$$

What is the value of y in the solution?

- A. $-\frac{16}{5}$
- B. $-\frac{1}{10}$
- C. $\frac{14}{5}$
- D. $\frac{1}{10}$

15. Shelley recorded the ages of the first 30 people that entered the public library on Saturday morning in the stem-and-leaf plot below.

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

What is the interquartile range of the ages?

- A. 38
- B. 47
- C. 22
- D. 40

16. The amount a plumber charges for a service call, s , is based on a base fee for him to come out plus an additional charge per hour, h , as shown in the equation below.

$$s = 45h + 75$$

Which part of the equation represents the charge per hour?

- A. 45
- B. h
- C. s
- D. 75

17. Sales tax across Pennsylvania varies from 6% to 8%, depending on the city. This can be represented by the system of inequalities shown below, where y is the dollar amount of the sales tax, and x is the purchase price of an item.

$$\begin{aligned} y &\geq 0.06x \\ y &\leq 0.08x \end{aligned}$$

Which of the following is a true statement?

- A. Jack could buy a \$19.99 book for under \$21, including tax.
- B. Lena could buy a \$32.79 purse for \$35, including tax.
- C. Mark could buy a \$209.99 television for a maximum of \$222.59, including tax.
- D. Kelly could buy a \$14.49 DVD for a minimum of \$15.65, including tax.

18. Heather has a budget of \$50 for food at her party. She spent \$32 on pizza. Cupcakes cost \$1.25 each. The inequality below can be used to determine the number of cupcakes (c) that Heather can buy.

$$32 + 1.25c \leq 50$$

Which statement about the number of cupcakes Heather can buy is true?

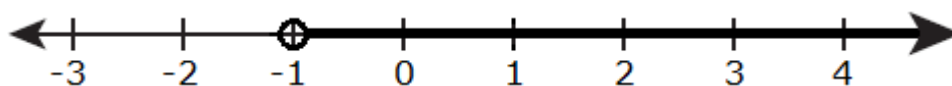
- A. Heather can buy a minimum of 14 cupcakes.
- B. Heather can buy a maximum of 15 cupcakes.
- C. Heather can buy a maximum of 14 cupcakes.
- D. Heather can buy a minimum of 15 cupcakes.

19. Simplify:

$$(3x^3 + x)(4x^4 - 2x^2 + 1)$$

- A. $7x^7 - x^5 + x^3 + x$
- B. $7x^{12} - 5x^6 + 4x^4 + 3x^3 - 2x^2 + x$
- C. $12x^{12} - 6x^6 + 4x^4 + 3x^3 - 2x^2 + x$
- D. $12x^7 - 2x^5 + x^3 + x$

20. The solution set of an inequality is graphed on the number line below.



The graph shows the solution set of which inequality?

- A. $4 - 3x < 7$
- B. $4 - 3x > 7$
- C. $4 - 3x > -7$
- D. $4 - 3x < -7$

21.

- (3, 7)
- (1, 2)
- (-1, 0)
- (-3, -3)

What is the range of the set of ordered pairs above?

- A. {7, -3}
- B. {7, 2, 0, -3}
- C. {3, -3}
- D. {3, 1, -1, -3}

Ron pushes a box up a ramp with a slope of $\frac{1}{10}$. He places the box on the ramp where it is $\frac{1}{2}$ of a foot above the ground and pushes it until the box is $2\frac{1}{2}$ feet above

22.

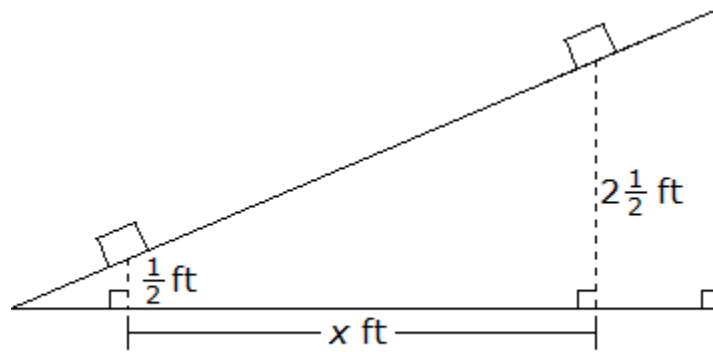
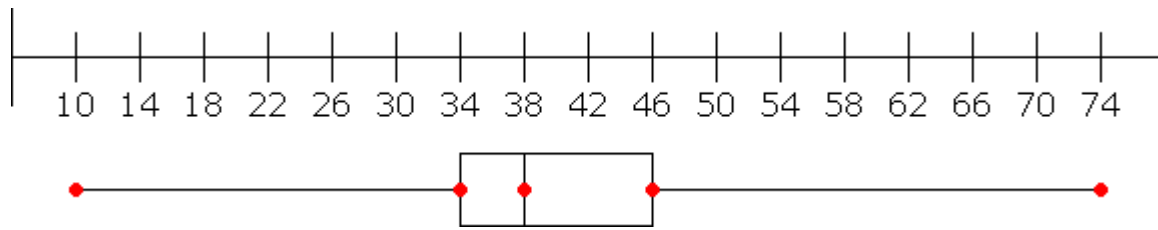


Figure is not drawn to scale.

What is the horizontal distance (x), in feet, that Ron pushed the box?

- A. 20
- B. 10
- C. 5
- D. 30

23.



Which set of data below could be described by the box-and-whisker plot above?

- A. {10, 32, 34, 37, 40, 42, 46, 49, 74}
- B. {10, 32, 34, 37, 38, 42, 46, 49, 74}
- C. {10, 32, 36, 37, 40, 42, 43, 49, 74}
- D. {10, 32, 36, 37, 38, 42, 43, 49, 74}

24. Find the equation of the line with a slope of $-\frac{4}{3}$ and a y -intercept of $(0, 1)$.

- A. $3x - 4y = 4$
- B. $4x + 3y = 3$
- C. $-4x + 3y = 3$
- D. $3x + 4y = 4$

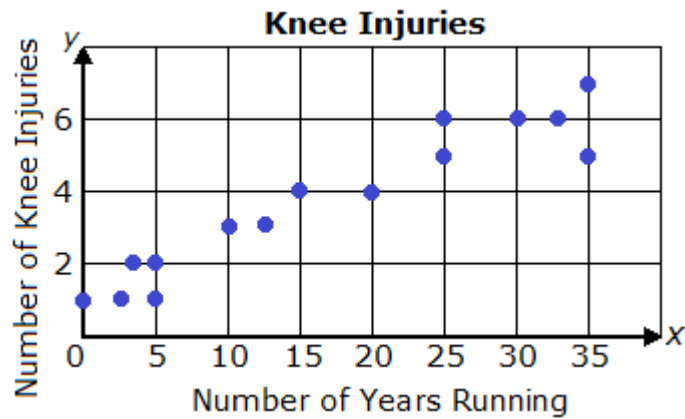
25. Tina sells hand-made jewelry at the flea market on Tuesdays. Every week she brings 145 pieces of jewelry with her to sell. The table below shows the average number of each item sold at the flea market over the past 6 months.

Item	Number Sold
Earrings (pair)	38
Necklaces	35
Bracelets	37
Rings	30

On Saturday, Tina is going to a craft fair that should have almost double the amount of people as the flea market. If she is going to make 320 pieces of jewelry to sell at the craft fair, approximately how many rings should she make, according to this data?

- A. 56
- B. 66
- C. 156
- D. 60

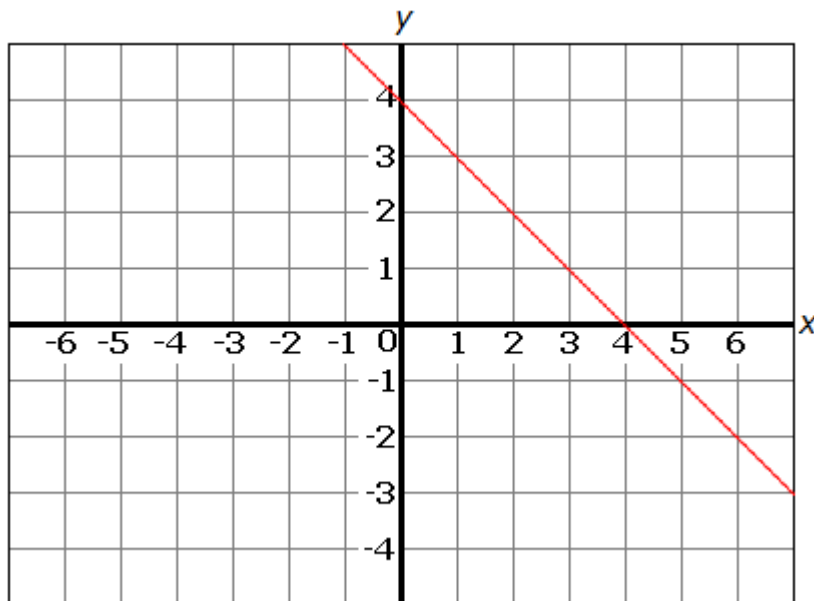
26. The scatter plot below shows the number of knee injuries, y , reported by runners over their lifetimes, based on the number of years they spent as runners, x .



Which equation best describes the line of best fit?

- A. $y = 0.18x + 0.8$
- B. $y = 1.36x + 0.8$
- C. $y = 1.36x + 0.1$
- D. $y = 0.18x + 0.1$

27. A linear function is shown on the graph below.



Which of the following equations matches the graph above?

- A. $y = x - 4$
- B. $y = -x - 4$
- C. $y = x + 4$
- D. $y = -x + 4$

28. A text messaging plan has a monthly fee for the first 100 messages and an additional charge for each text message after the first 100. The cost, c , in dollars, of the text messaging plan after m additional messages are used is described by the equation $c = 0.12m + 5.99$. Which statement is true?

- A. Each additional text message costs \$5.99, and the monthly fee is \$0.12.
- B. The total cost for sending 112 text messages is \$1.44.
- C. Each additional text message costs \$0.12, and the monthly fee is \$5.99.
- D. The total cost for sending 112 text messages is \$6.11.

29. The password for a school's grading system is a 4-digit code. If the password is composed of digits one through nine, what is the probability that the password is composed of a one, a two, a three, and a four?

- A. $\frac{1}{5,040}$
- B. $\frac{1}{36}$
- C. $\frac{4}{9}$
- D. $\frac{1}{6,561}$

30. A linear equation is shown below.

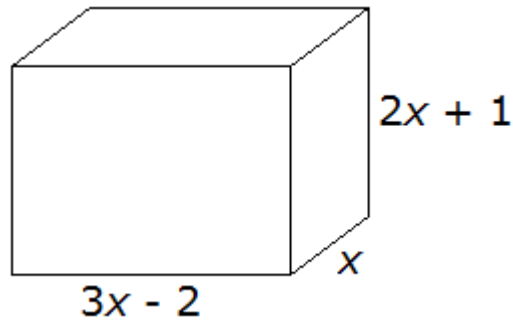
$$2x - 3y = 4$$

What is the slope of the equation?

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

OPEN ENDED FOR KEYSTONE

1. Alena is packing a box that has a height of one inch more than twice the width and a length of two inches less than three times the width, as shown in the diagram below.



- A. Write a polynomial expression, in simplified form, that represents the volume of the box.
- B. Alena packs another box. This box has a square base with an area of $9x^2 - 6x + 1$ square inches. Write an expression to represent one side length of the base.
- C. Alena has a third box whose height is the same as the first box, but whose volume is $6x^3 + 15x^2 + 6x$ cubic inches. Determine how much wider and longer this box is than the first box. Assume that the length of the box has a larger coefficient than the width. Show all your work. Explain why you did each step.

2. Reid and Sharon work in two different clothing stores. Reid's store sells shirts for \$14 each and pants for \$39 each. Sharon's store sells shirts for \$12 each and pants for \$44 each. One day, Reid sold \$145 worth of shirts and pants, and Sharon sold the same number of shirts and pants, but her sales were worth \$156. When x is the number of shirts sold and y is the number of pants sold, the situation can be modeled by a system of linear equations.

A. Write the two equations that form the system of equations which models the information above.

equations: _____

B. Use the equations found in **Part A** to determine how many shirts and pants Reid sold.

shirts: _____

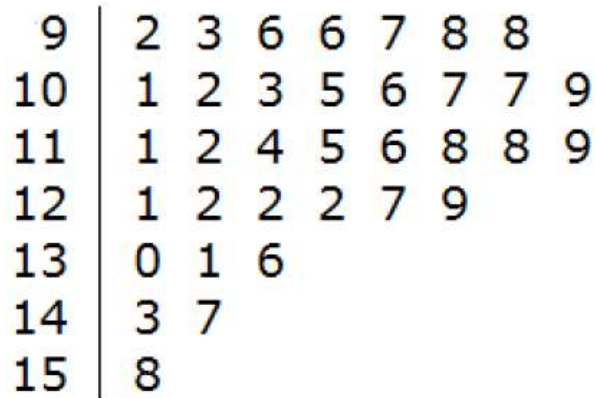
pants: _____

C. On another day, Reid and Sharon each sold 5 shirts and 2 pants. Who sold the greatest dollar amount of merchandise?

3.

The lengths, in minutes, of the movies in Raul's DVD collection are shown in the stem-and-leaf plot below.

Movie Lengths



Key	
10 3	= 103 minutes

A. What is the interquartile range of the movie lengths?

interquartile range: _____ minutes

B. Raul wants to know the mean length of the shortest 25% of his movies. What is the mean length of the shortest 25% of the movies?

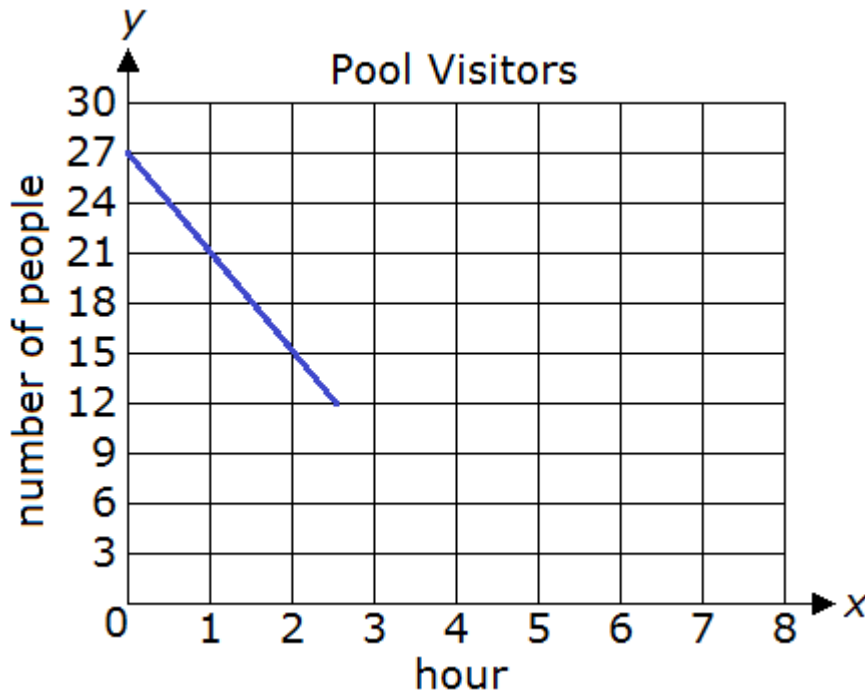
mean of the shortest 25%: _____ minutes

C. Raul bought 4 new movies with lengths of 126, 116, 104, and 134 minutes. Find the new interquartile range and the new mean length of the shortest 25% of the movies.

interquartile range: _____ minutes

mean of the shortest 25%: _____ minutes

4. Tom recorded how many people were at the community pool over a few hours and displayed some of the data on the graph below. Assume the pattern continues.



- A. Write an equation to find how many people were at the pool (y) based on the hour (x).
- B. Use the equation found in **part A** to determine after how many hours there will be zero people at the pool. Show all your work. Explain why you did each step.
- C. Explain what the slope of the graph means in the situation.

Answers

1. D
2. A
3. C
4. B
5. B
6. D
7. A
8. B
9. B
10. C
11. A
12. B
13. A
14. C
15. C
16. A
17. B
18. C
19. D
20. A
21. B
22. A
23. D
24. B
25. B
26. A
27. D
28. C
29. D
30. C