

Keystone Exam... Practice Test # 3**Part 1 – Multiple Choice**

- _____ 1) Evan always drives between 45 and 60 miles per hour on his commute. The distance he travels can be represented in the system of inequalities below, where x is the number of minutes and y is the number of miles.

$$y > 0.75x$$

$$y < x$$

Which of the following is a true statement?

- A) When the number of minutes he's driven (x) is 60, the miles he has driven (y) is between 15 and 60.
- B) When the number of minutes he's driven (x) is 40, the miles he has driven (y) is between 30 and 40.
- C) When the number of minutes he's driven (y) is 24, the miles he has driven (x) is between 24 and 32.
- D) When the number of minutes he's driven (y) is 36, the miles he has driven (x) is between 27 and 36.
- _____ 2) A Halloween attraction charges \$52 for each day pass and \$95 for each night pass. Last October, 86 day passes were sold and 1,245 night passes were sold. What is the closest estimate of the total amount of money paid for the passes last October?

A) \$175,000

B) \$130,000

C) \$140,000

D) \$150,000

- _____ 3) Write an expression for the area of the rectangle.



$$x^2 - 4x + 5$$

$$x + 8$$

A) $9x^2 - 31x + 40$

B) $x^3 - 4x$

C) $x^2 - 3x + 13$

D) $x^3 + 4x^2 - 27x + 40$

_____ 4) For what value of x should the expression be further simplified?

$$\sqrt{5x}$$

A) $x = 2$

B) $x = 10$

C) $x = 11$

D) $x = 13$

_____ 5) Find the least common multiple (LCM) for the two polynomials.

$$108xy^2$$

$$27xyz$$

A) $27xy$

B) $108xyz$

C) $108xy^2z$

D) $2916xyz$

_____ 6) What is the y -intercept of the graph $6x - 3y = 24$?

A) -8

B) 2

C) -3

D) 24

_____ 7) The cost for cellular phone service is \$32 per month plus \$0.08 for each minute. Which equation expresses the cost, c , in dollars, as a function of the number of minutes, m ?

A) $c = 0.08m + 32$

B) $c = 8m + 32$

C) $m = 32 - 8c$

D) $c = 32m + 0.08$

_____ 8) Solve $S = \pi rL + \pi r^2$ for L .

A) $L = S - r$

B) $L = \frac{S}{\pi r} - r$

C) $L = r - \frac{S}{\pi r}$

D) $L = \frac{S}{\pi r^2} - r$

_____ 12) The video store rents DVDs for \$3.75 each and video games for \$4.00 each. Write an equation in standard form for the number of DVDs d and video games g that a customer could rent with \$18.

A) $3.75g + 4d = 18$

B) $3.75d = 4g + 18$

C) $3.75 + 4 = d$

D) $3.75d + 4g = 18$

_____ 13) What is the range of $f(x) = \frac{4}{3}x + 4$ for the domain $\{-1, 3, 7, 9\}$?

A) $\left\{\frac{8}{3}, 10, \frac{40}{3}, 16\right\}$

B) $\left\{\frac{8}{3}, 8, \frac{40}{3}, 16\right\}$

C) $\left\{\frac{8}{3}, 7, \frac{40}{3}, 15\right\}$

D) $\left\{\frac{8}{3}, 8, \frac{40}{3}\right\}$

_____ 14) Jeannie solved the quadratic equation shown below by factoring.

$$x^2 + 2x - 8 = 0$$

Which of the following shows a step in solving the equation shown?

A) $(x + 2)(x + 4) = 0$

B) $(x + 2)(x - 4) = 0$

C) $(x - 2)(x + 4) = 0$

D) $(x - 2)(x - 4) = 0$

_____ 15) If $x \neq 3$, which of the following shows the expression below in simplest form?

$$\frac{3x^2 - 27}{x - 3}$$

A) $3(x + 3)$

B) $3(x - 3)$

C) $3(x + 9)$

D) $3(x - 9)$

_____ 16) Which property of equality justifies step f ?

- a. $26 = -16 - 8x$
- b. $26 = -16 + (-8x)$
- c. $26 + 16 = -16 + (-8x) + 16$
- d. $26 + 16 = -16 + 16 + (-8x)$
- e. $42 = -8x$
- f. $\frac{42}{-8} = \frac{-8x}{-8}$
- g. $-\frac{21}{4} = x$

- A) Multiplication Property of Equality
- B) Subtraction Property of Equality
- C) Division Property of Equality
- D) Addition Property of Equality

_____ 17) A polynomial expression is shown below.

$$(mx^2 - 1)(3x^2 - 6x + 4) - (9x^4 + 4x^2)$$

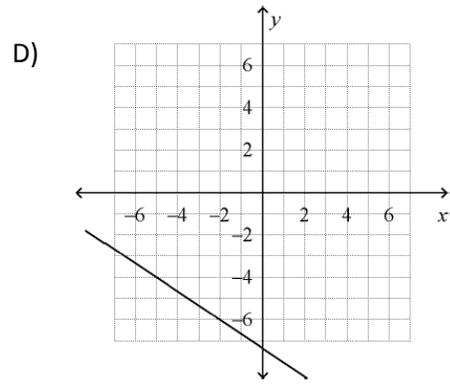
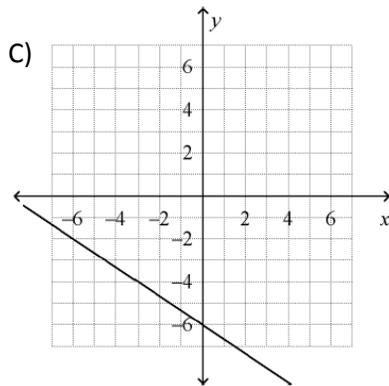
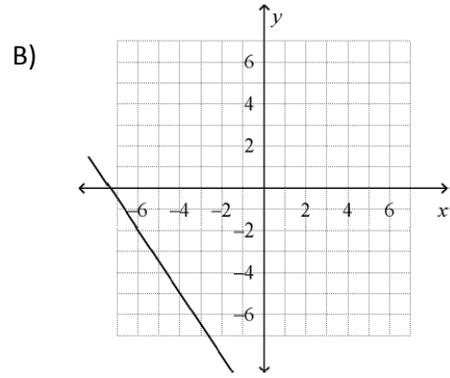
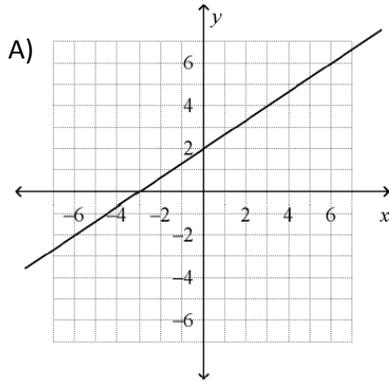
The expression is simplified to $-18x^3 + 5x^2 + 6x - 4$. What is the value of m ?

- A) 1
- B) -3
- C) 3
- D) -1

_____ 18) Which set of slopes would belong to a pair of lines perpendicular to one another?

- A) $m = \frac{3}{10}$ and $m = -\frac{10}{3}$
- B) $m = \frac{3}{10}$ and $m = -\frac{3}{10}$
- C) $m = \frac{3}{10}$ and $m = \frac{3}{10}$
- D) $m = \frac{3}{10}$ and $m = \frac{10}{3}$

_____ 19) What is the graph of $y + 2 = -\frac{2}{3}(x + 6)$?



_____ 20) A local citizen wants to fence a rectangular community garden. The length of the garden should be at least 110 feet and the distance around should be no more than 380 feet. Which system of inequalities models the possible dimensions of the garden?

A) $y \geq 110$
 $2x + 2y \leq 380$

B) $y \leq 110$
 $2x + 2y \leq 380$

C) $y \geq 110$
 $2x + 2y \geq 380$

D) $y \leq 110$
 $2x + 2y \geq 380$

_____ 21) A polling firm, hired to estimate the likelihood of the passage of an upcoming referendum, obtained the set of survey responses to make its estimate. The encoding system for the data is 1 = FOR, 2 = AGAINST. If the referendum were held today, estimate the probability that it would pass.

1, 2, 2, 1, 1, 2, 1, 2, 2, 1, 1, 1, 2, 1, 2, 1, 1, 1, 2, 1

A) 0.5

B) 0.65

C) 0.6

D) 0.4

Part 2 – Constructed Response

24) Bethany and Calista are sisters who both run marathons. Today they are racing against each other in the same marathon. Because there are thousands of people racing, Bethany and Calista are assigned random starting positions. Bethany starts at the starting line, while Calista starts a half-mile behind the starting line. Calista runs one mile in 12 minutes, while Bethany runs one mile in 15 minutes. So, although Calista starts behind Bethany, she hopes to pass her sister at some point during the race. Let x represent the amount of time in hours that Bethany or Calista run and let y represent distance after the starting line in miles.

A) The rate of speed at which someone runs is frequently stated in miles per hour. Find Bethany's speed and Calista's speed in miles per hour.

Bethany: _____

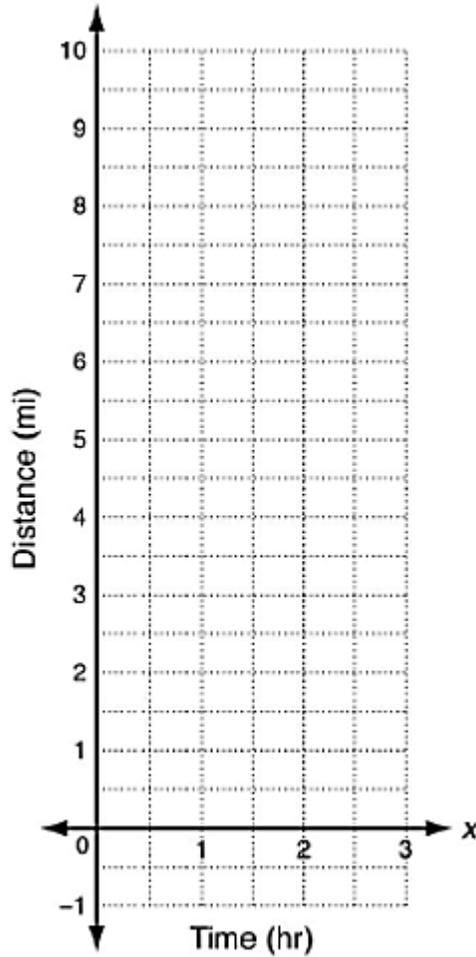
Calista: _____

B) Write a linear equation in slope-intercept form that describes distance as a function of time for both Bethany and Calista.

Bethany: _____

Calista: _____

C) Graph the system of equations that you wrote from part B on the provided grid.



D) Use your graph from part C to estimate each of the following questions.

➤ Who is in the lead after 15 minutes? _____

➤ At what time will Calista catch up with Bethany? _____

➤ How far after the starting line will the sisters catch up to each other?

➤ Who is in the lead after 2 hours if each sister keeps running at a steady pace?

E) A marathon is 26.2 miles. Which sister do you think will cross the finish line first? Explain.

Explanation:

- 25) Jack's family is on a car trip.

When they are 84 miles from home, Jack begins recording their distance driven each hour in the table below.

Distance by Hour

Time in Hours	Distance in Miles
0	84
1	146
2	208
3	270

The pattern continues.

- A) Write an equation to find distance driven in miles (d) after a given number of hours (h).

Equation: _____

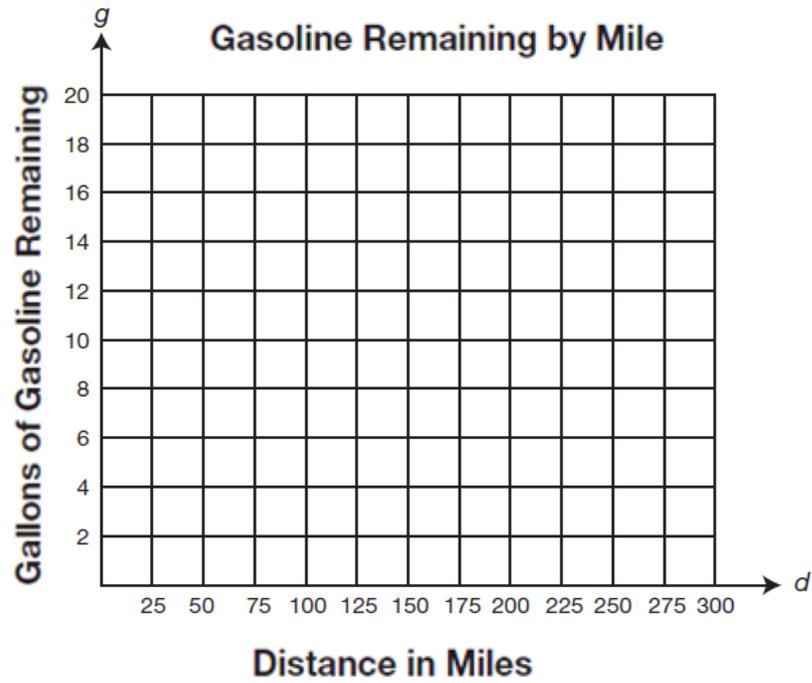
- B) Jack also kept track of the remaining gasoline. The equation shown below can be used to find the gallons of gasoline remaining (g) after distance driven (d).

$$g = 16 - \frac{1}{20}d$$

Use the equation to find the missing values for gallons of gasoline remaining.

Distance Driven in Miles (d)	Gallons of Gasoline Remaining (g)
100	
200	
300	

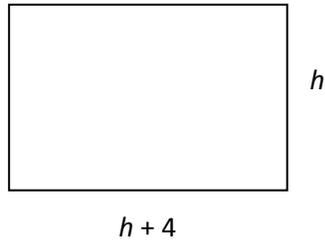
C) Draw the graph of the line formed by the points in the table from **part B**.



D) Explain why the slope of the line drawn in **part C** must be negative.

Explanation:

- 26) Kyle creates a painting on a rectangular canvas with a width that is four inches longer than the height, as shown in the diagram below.



- A) Write a polynomial expression, in simplified form, that represents the area of the canvas.

Expression: _____

Kyle adds a 3-inch-wide frame around all sides of his canvas.

- B) Write a polynomial expression, in simplified form, that represents the **total area** of the canvas and the frame.

Expression: _____

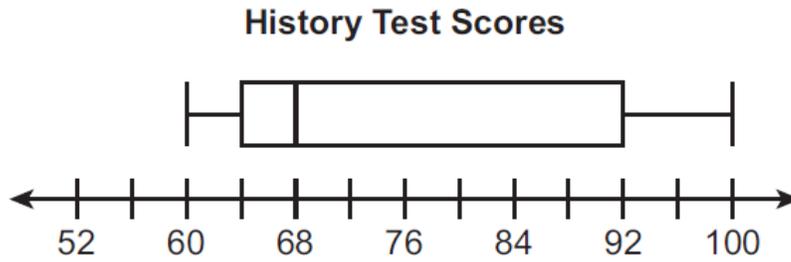
Kyle is unhappy with his 3-inch-wide frame, so he decides to put a frame with a different width around his canvas. The total area of the canvas and the new frame is given by the polynomial $h^2 + 8h + 12$, where h represents the height of the canvas.

C) Determine the width of the new frame. Show all your work. Explain why you did each step.

Explanation:

Width: _____

- 27) The box-and-whisker plot shown below represents students' test scores on Mr. Tyson's test.



- A) What is the range of scores for the history test? What is the inter-quartile range?

Range: _____

Inter-Quartile Range: _____

- B) What is the **best** estimate for the percent of students scoring greater than 92 on the test?

Percent (%): _____

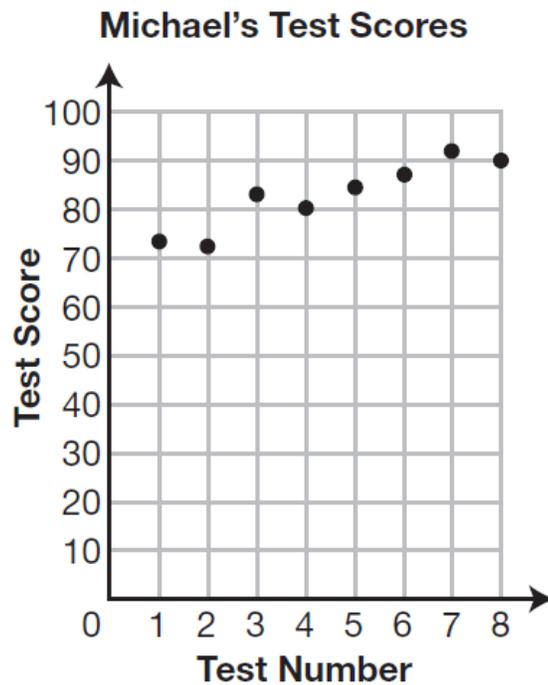
Mr. Tyson wanted more than half of the students to score 75 or greater on the test.

C) Explain how you know that more than half of the students did **not** score greater than 75.

Explanation:

Michael is a student in Mr. Tyson's class. The scatter plot below shows Michael's test scores for each test given by Mr. Tyson.

D) Draw a line of best fit on the scatter plot below.



E) Write an equation in slope-intercept form of the line of best fit you drew in **part D**.

Equation: _____