Part I

Answer all questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. For each question, write on the separate answer sheet the numeral preceding the word or expression that best completes the statement or answers the question. [60]

Use this space for computations.

1 Which value of p is the solution of $5p - 1 = 2p + 20$?

(1) $\frac{19}{7}$

(2) $\frac{19}{3}$

(3) 3

(4) 7

2 The statement $2 + 0 = 2$ is an example of the use of which property of real numbers?

(1) associative

(2) additive identity

(3) additive inverse

(4) distributive

3 Mrs. Smith wrote "Eight less than three times a number is greater than fifteen" on the board. If x represents the number, which inequality is a correct translation of this statement?

(1) $3x - 8 > 15$

(2) $3x - 8 < 15$

(3) $8 - 3x > 15$

(4) $8 - 3x < 15$

Use this space for computations.

4 Which statement is true about the data set 3, 4, 5, 6, 7, 7, 10?

(1) mean = mode
(2) mean > mode
(3) mean = median
(4) mean < median

5 Which value of x is in the solution set of the inequality $-4x + 2 > 10$?

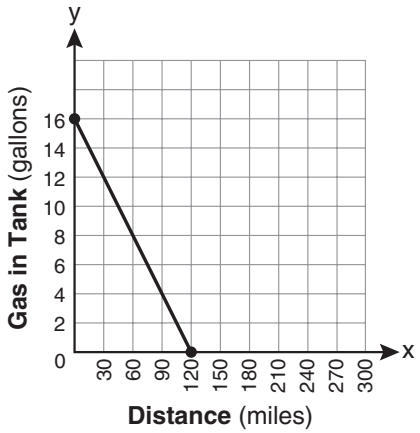
(1) -2
(2) 2
(3) 3
(4) -4

6 Factored completely, the expression $2x^2 + 10x - 12$ is equivalent to

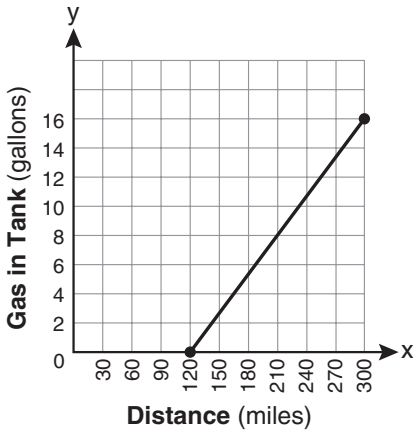
(1) $2(x - 6)(x + 1)$
(2) $2(x + 6)(x - 1)$
(3) $2(x + 2)(x + 3)$
(4) $2(x - 2)(x - 3)$

Use this space for computations.

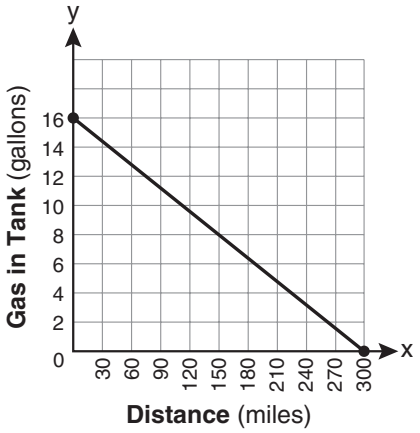
7 The gas tank in a car holds a total of 16 gallons of gas. The car travels 75 miles on 4 gallons of gas. If the gas tank is full at the beginning of a trip, which graph represents the rate of change in the amount of gas in the tank?



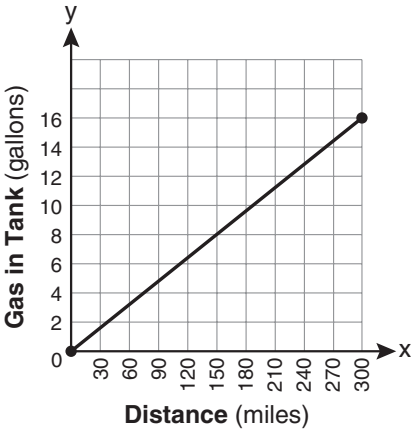
(1)



(3)



(2)



(4)

8 If $3ax + b = c$, then x equals

(1) $c - b + 3a$

(2) $c + b - 3a$

(3) $\frac{c-b}{3a}$

(4) $\frac{b-c}{3a}$

Use this space for computations.

9 The length of the hypotenuse of a right triangle is 34 inches and the length of one of its legs is 16 inches. What is the length, in inches, of the other leg of this right triangle?

(1) 16
(2) 18
(3) 25
(4) 30

10 Which equation represents a line parallel to the x-axis?

(1) $x = 5$
(2) $y = 10$
(3) $x = \frac{1}{3}y$
(4) $y = 5x + 17$

11 Sam and Odel have been selling frozen pizzas for a class fundraiser. Sam has sold half as many pizzas as Odel. Together they have sold a total of 126 pizzas. How many pizzas did Sam sell?

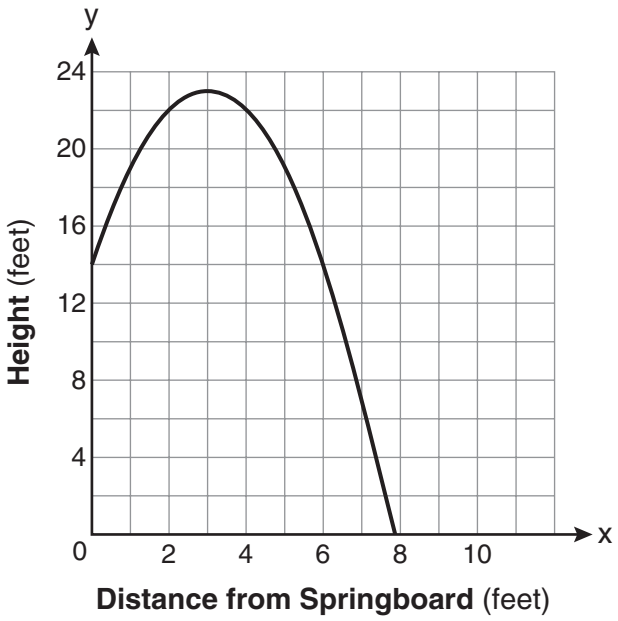
(1) 21
(2) 42
(3) 63
(4) 84

12 Which ordered pair is in the solution set of the system of equations $y = -x + 1$ and $y = x^2 + 5x + 6$?

(1) (–5,–1)
(2) (–5,6)
(3) (5,–4)
(4) (5,2)

Use this space for computations.

13 A swim team member performs a dive from a 14-foot-high springboard. The parabola below shows the path of her dive.



Which equation represents the axis of symmetry?

(1) $x = 3$

(2) $y = 3$

(3) $x = 23$

(4) $y = 23$

14 Nicole's aerobics class exercises to fast-paced music. If the rate of the music is 120 beats per minute, how many beats would there be in a class that is 0.75 hour long?

(1) 90

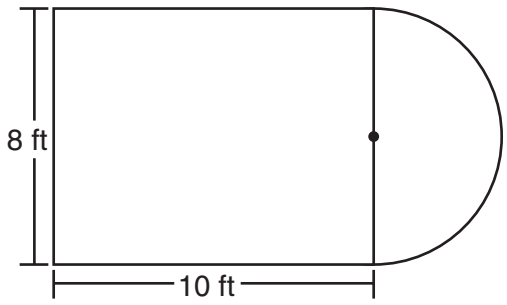
(2) 160

(3) 5,400

(4) 7,200

Use this space for computations.

15 Luis is going to paint a basketball court on his driveway, as shown in the diagram below. This basketball court consists of a rectangle and a semicircle.



Which expression represents the area of this basketball court, in square feet?

(1) 80

(2) $80 + 8\pi$

(3) $80 + 16\pi$

(4) $80 + 64\pi$

16 John is going to line up his four golf trophies on a shelf in his bedroom. How many different possible arrangements can he make?

(1) 24

(2) 16

(3) 10

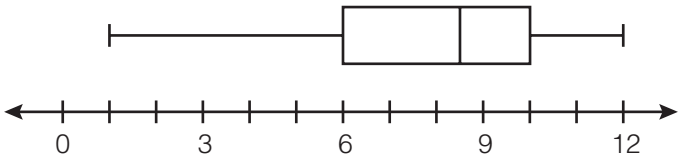
(4) 4

Use this space for computations.

17 A rectangle has an area of 24 square units. The width is 5 units less than the length. What is the length, in units, of the rectangle?

(1) 6
(2) 8
(3) 3
(4) 19

18 What is the value of the third quartile shown on the box-and-whisker plot below?



(1) 6
(2) 8.5
(3) 10
(4) 12

19 When $3g^2 - 4g + 2$ is subtracted from $7g^2 + 5g - 1$, the difference is

(1) $-4g^2 - 9g + 3$
(2) $4g^2 + g + 1$
(3) $4g^2 + 9g - 3$
(4) $10g^2 + g + 1$

20 Which value of x is the solution of $\frac{2x}{5} + \frac{1}{3} = \frac{7x - 2}{15}$?

(1) $\frac{3}{5}$
(2) $\frac{31}{26}$
(3) 3
(4) 7

Use this space for computations.

21 Which expression represents $\frac{25x - 125}{x^2 - 25}$ in simplest form?

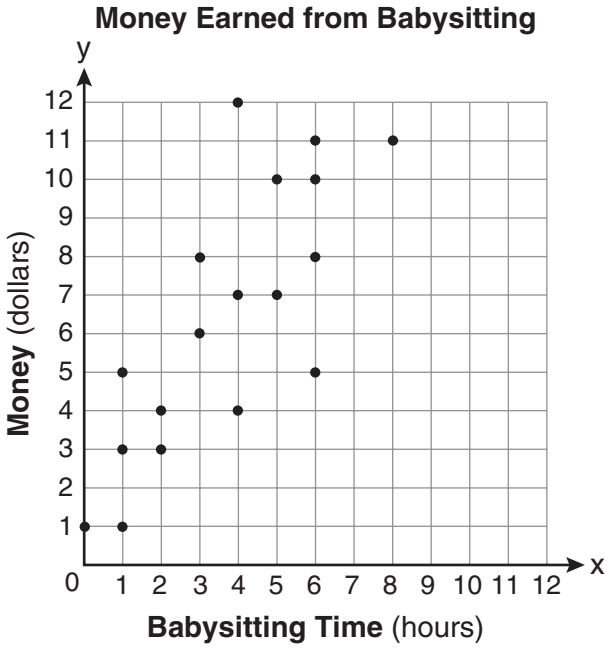
(1) $\frac{5}{x}$

(2) $\frac{-5}{x}$

(3) $\frac{25}{x - 5}$

(4) $\frac{25}{x + 5}$

22 Which equation most closely represents the line of best fit for the scatter plot below?



(1) $y = x$

(2) $y = \frac{2}{3}x + 1$

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

(4) $y = \frac{3}{2}x + 1$

23 In a linear equation, the independent variable increases at a constant rate while the dependent variable decreases at a constant rate. The slope of this line is

(1) zero

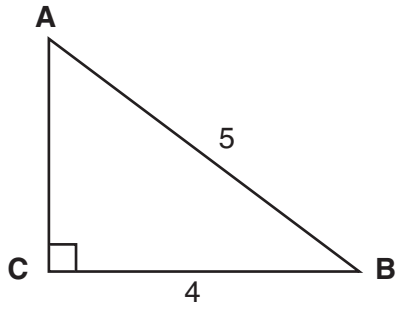
(2) negative

(3) positive

(4) undefined

Use this space for computations.

24 Which equation could be used to find the measure of one acute angle in the right triangle shown below?



(1) $\sin A = \frac{4}{5}$

(2) $\tan A = \frac{5}{4}$

(3) $\cos B = \frac{5}{4}$

(4) $\tan B = \frac{4}{5}$

25 Which ordered pair is in the solution set of the following system of inequalities?

$$y < \frac{1}{2}x + 4$$

$$y \geq -x + 1$$

(1) (–5,3)

(2) (0,4)

(3) (3,–5)

(4) (4,0)

26 What is the product of $\frac{4x}{x-1}$ and $\frac{x^2-1}{3x+3}$ expressed in simplest form?

(1) $\frac{4x}{3}$

(2) $\frac{4x^2}{3}$

(3) $\frac{4x^2}{3(x+1)}$

(4) $\frac{4(x+1)}{3}$

Use this space for computations.

27 Which expression is equivalent to $(3x^2)^3$?

(1) $9x^5$ (3) $27x^5$

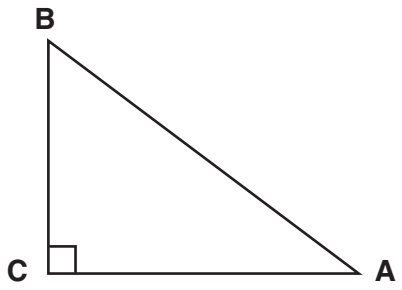
(2) $9x^6$ (4) $27x^6$

28 Ryan estimates the measurement of the volume of a popcorn container to be 282 cubic inches. The actual volume of the popcorn container is 289 cubic inches. What is the relative error of Ryan's measurement to the *nearest thousandth*?

(1) 0.024 (3) 0.096

(2) 0.025 (4) 1.025

29 In the diagram of $\triangle ABC$ shown below, $BC = 10$ and $AB = 16$.



To the *nearest tenth of a degree*, what is the measure of the largest acute angle in the triangle?

(1) 32.0 (3) 51.3

(2) 38.7 (4) 90.0

Use this space for computations.

30 The faces of a cube are numbered from 1 to 6. If the cube is tossed once, what is the probability that a prime number or a number divisible by 2 is obtained?

(1) $\frac{6}{6}$

(2) $\frac{5}{6}$

(3) $\frac{4}{6}$

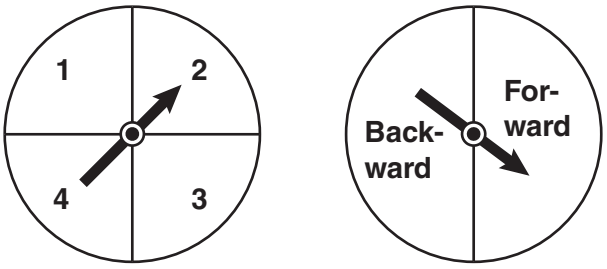
(4) $\frac{1}{6}$

Part II

Answer all questions in this part. Each correct answer will receive 2 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [6]

31 In a game of ice hockey, the hockey puck took 0.8 second to travel 89 feet to the goal line. Determine the average speed of the puck in feet per second.

32 Brianna is using the two spinners shown below to play her new board game. She spins the arrow on each spinner once. Brianna uses the first spinner to determine how many spaces to move. She uses the second spinner to determine whether her move from the first spinner will be forward or backward.



Find the probability that Brianna will move *fewer than* four spaces and *backward*.

33 Twelve players make up a high school basketball team. The team jerseys are numbered 1 through 12. The players wearing the jerseys numbered 3, 6, 7, 8, and 11 are the only players who start a game. Using set notation, list the complement of this subset.

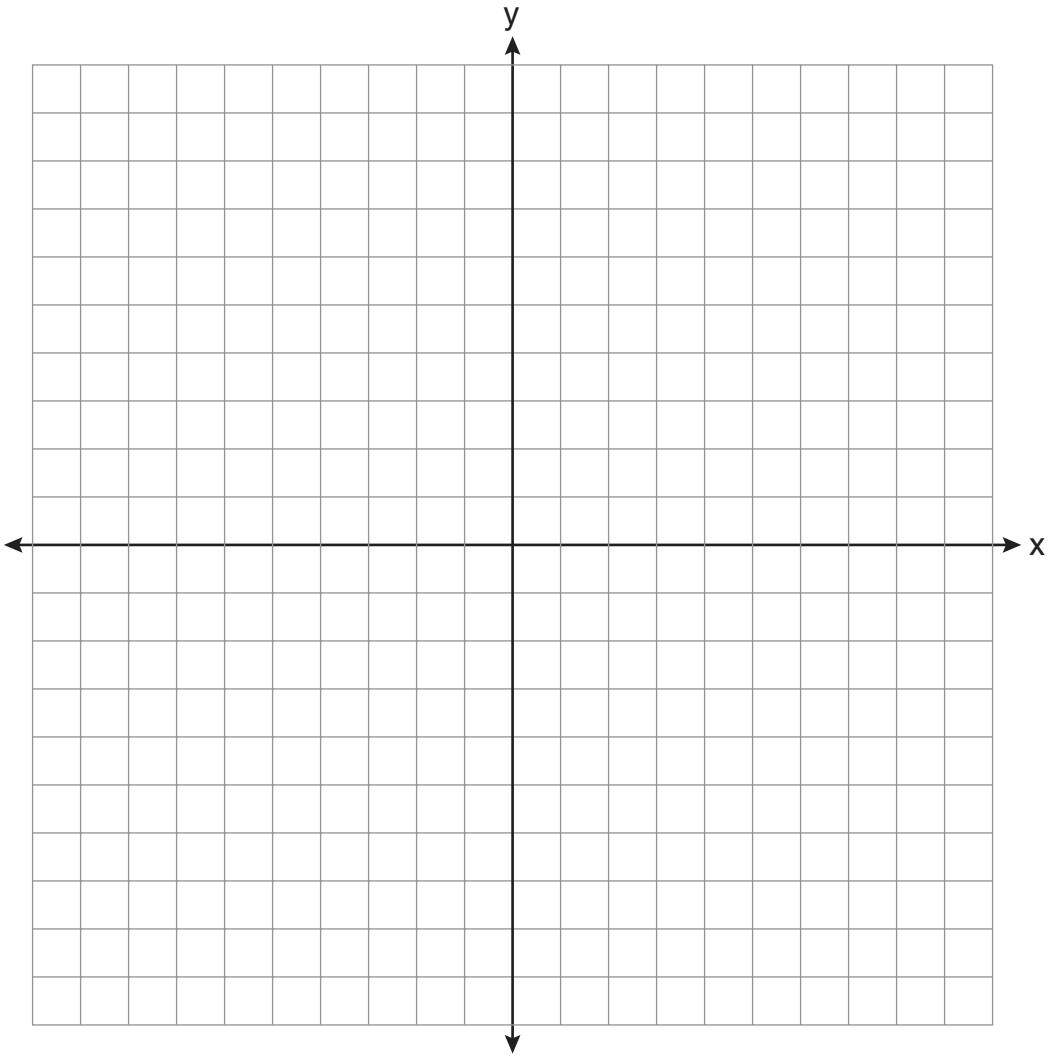
Part III

Answer all questions in this part. Each correct answer will receive 3 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [9]

34 Express the product of $3\sqrt{20}(2\sqrt{5} - 7)$ in simplest radical form.

35 On the set of axes below, draw the graph of $y = 2^x$ over the interval $-1 \leq x \leq 3$.

Will this graph ever intersect the x-axis? Justify your answer.



36 Write an equation that represents the line that passes through the points (5,4) and (−5,0).

Part IV

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

37 The cost of 3 markers and 2 pencils is \$1.80. The cost of 4 markers and 6 pencils is \$2.90. What is the cost of *each* item? Include appropriate units in your answer.

38 Twenty students were surveyed about the number of days they played outside in one week. The results of this survey are shown below.

{6, 5, 4, 3, 0, 7, 1, 5, 4, 4, 3, 2, 2, 3, 2, 4, 3, 4, 0, 7}

Complete the frequency table below for these data.

Number of Days Outside

Interval	Tally	Frequency
0–1		
2–3		
4–5		
6–7		

Complete the cumulative frequency table below using these data.

Number of Days Outside

Interval	Cumulative Frequency
0–1	
0–3	
0–5	
0–7	

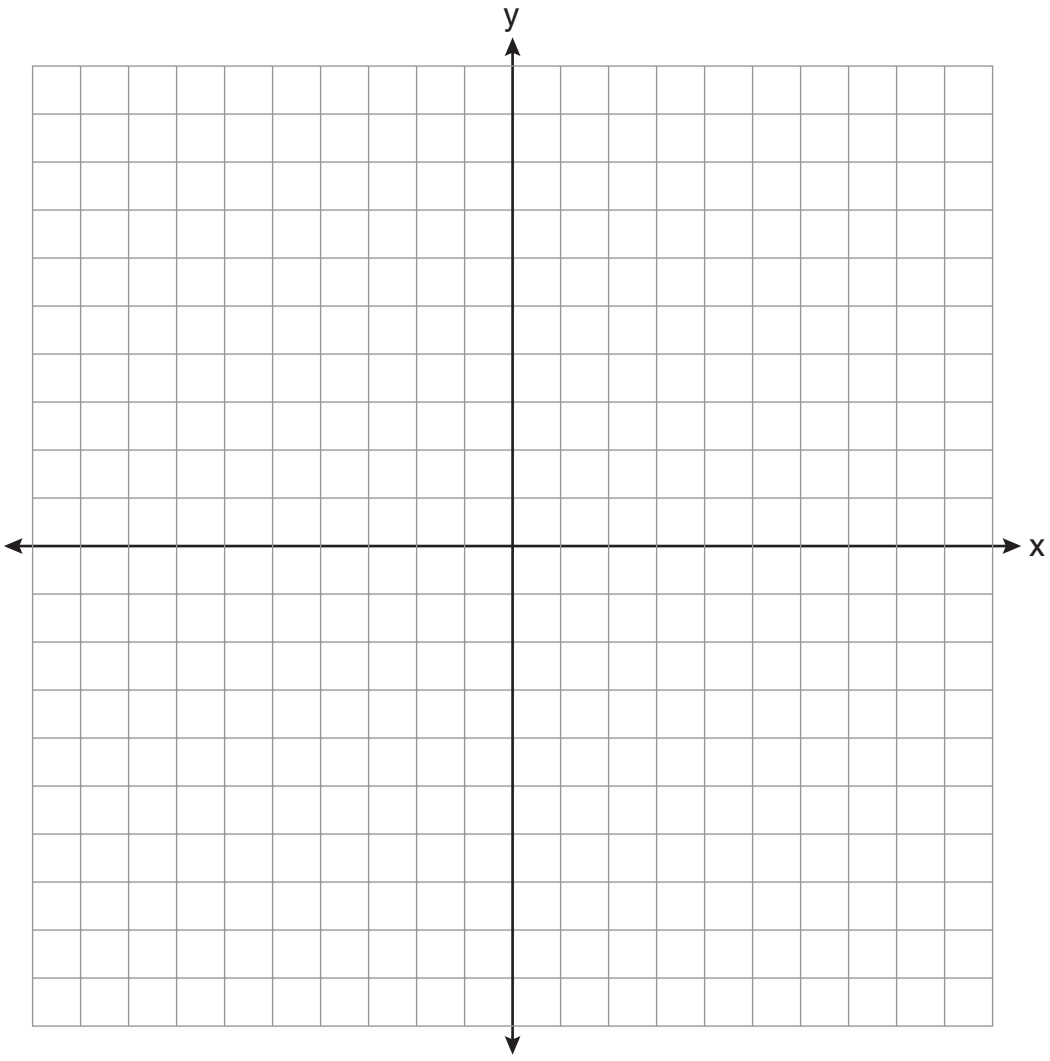
This question continues on the next page.

Question 38 continued

On the grid below, create a cumulative frequency histogram based on the table you made on the previous page.

39 On the set of axes below, solve the following system of equations graphically and state the coordinates of all points in the solution set.

$$y = x^2 + 4x - 5$$
$$y = x - 1$$



Part I

Allow a total of 60 credits, 2 credits for each of the following. Allow credit if the student has written the correct answer instead of the numeral 1, 2, 3, or 4.

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