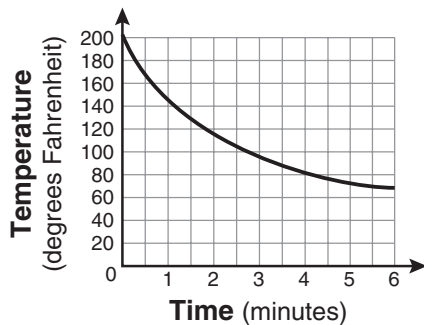


Use this space for computations.

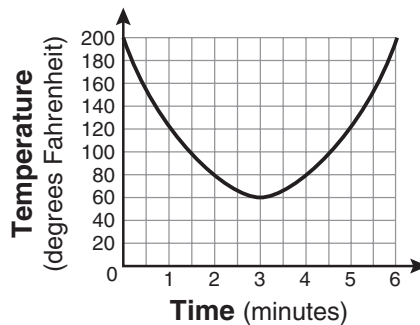
4 Tamara has a cell phone plan that charges \$0.07 per minute plus a monthly fee of \$19.00. She budgets \$29.50 per month for total cell phone expenses without taxes. What is the maximum number of minutes Tamara could use her phone each month in order to stay within her budget?

- (1) 150
- (2) 271
- (3) 421
- (4) 692

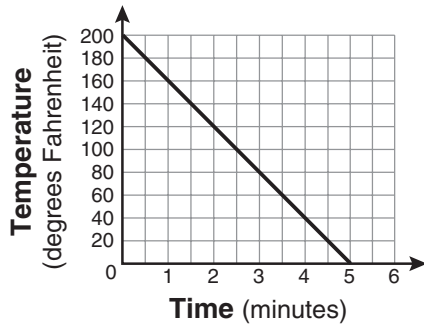
5 Antwaan leaves a cup of hot chocolate on the counter in his kitchen. Which graph is the best representation of the change in temperature of his hot chocolate over time?



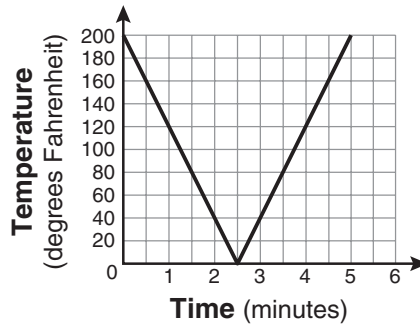
(1)



(3)



(2)



(4)

6 What is the solution of $\frac{k+4}{2} = \frac{k+9}{3}$?

- (1) 1
- (2) 5
- (3) 6
- (4) 14

**Use this space for
computations.**

7 Alex earned scores of 60, 74, 82, 87, 87, and 94 on his first six algebra tests. What is the relationship between the measures of central tendency of these scores?

- (1) median < mode < mean (3) mode < median < mean
(2) mean < mode < median (4) mean < median < mode

8 The New York Volleyball Association invited 64 teams to compete in a tournament. After each round, half of the teams were eliminated. Which equation represents the number of teams, t , that remained in the tournament after r rounds?

- (1) $t = 64(r)^{0.5}$ (3) $t = 64(1.5)^r$
(2) $t = 64(-0.5)^r$ (4) $t = 64(0.5)^r$

9 The expression $9x^2 - 100$ is equivalent to

- (1) $(9x - 10)(x + 10)$ (3) $(3x - 100)(3x - 1)$
(2) $(3x - 10)(3x + 10)$ (4) $(9x - 100)(x + 1)$

10 What is an equation of the line that passes through the points $(3,-3)$ and $(-3,-3)$?

- (1) $y = 3$ (3) $y = -3$
(2) $x = -3$ (4) $x = y$

Use this space for
computations.

11 If the formula for the perimeter of a rectangle is $P = 2l + 2w$, then w can be expressed as

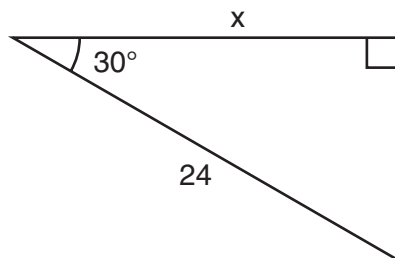
(1) $w = \frac{2l - P}{2}$

(3) $w = \frac{P - l}{2}$

(2) $w = \frac{P - 2l}{2}$

(4) $w = \frac{P - 2w}{2l}$

12 In the right triangle shown in the diagram below, what is the value of x to the nearest whole number?



(1) 12

(3) 21

(2) 14

(4) 28

13 What is the slope of the line that passes through the points $(2,5)$ and $(7,3)$?

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

(3) $\frac{8}{9}$

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

(4) $\frac{9}{8}$

Use this space for computations.

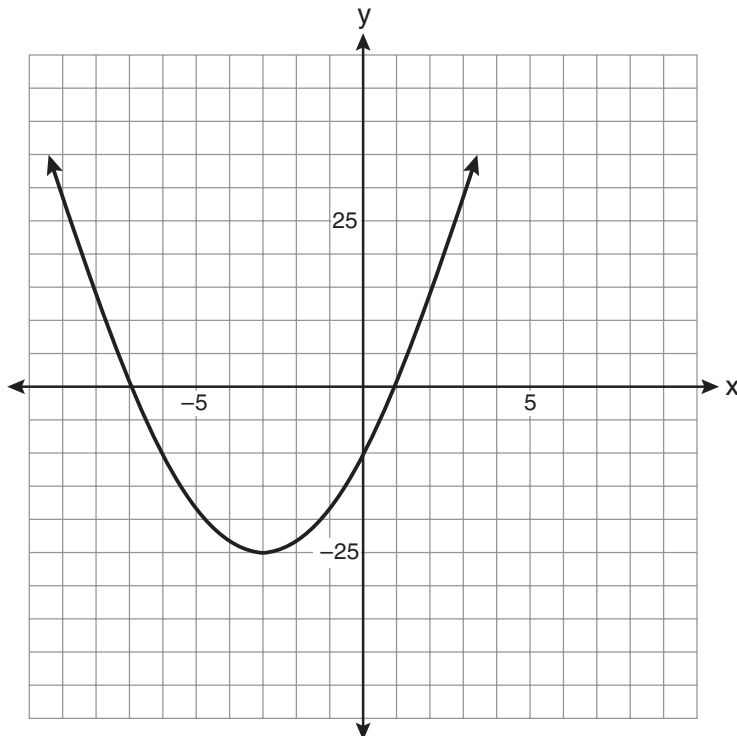
14 What are the roots of the equation $x^2 - 10x + 21 = 0$?

- (1) 1 and 21
- (2) -5 and -5
- (3) 3 and 7
- (4) -3 and -7

15 Rhonda has \$1.35 in nickels and dimes in her pocket. If she has six more dimes than nickels, which equation can be used to determine x , the number of nickels she has?

- (1) $0.05(x + 6) + 0.10x = 1.35$
- (2) $0.05x + 0.10(x + 6) = 1.35$
- (3) $0.05 + 0.10(6x) = 1.35$
- (4) $0.15(x + 6) = 1.35$

16 Which equation represents the axis of symmetry of the graph of the parabola below?



- (1) $y = -3$
- (2) $x = -3$
- (3) $y = -25$
- (4) $x = -25$

Use this space for
computations.

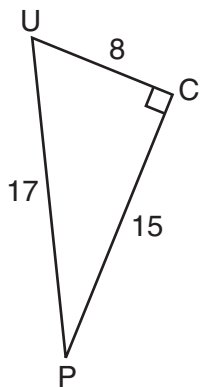
17 The set $\{1,2,3,4\}$ is equivalent to

- (1) $\{x \mid 1 < x < 4, \text{where } x \text{ is a whole number}\}$
- (2) $\{x \mid 0 < x < 4, \text{where } x \text{ is a whole number}\}$
- (3) $\{x \mid 0 < x \leq 4, \text{where } x \text{ is a whole number}\}$
- (4) $\{x \mid 1 < x \leq 4, \text{where } x \text{ is a whole number}\}$

18 What is the value of x in the equation $\frac{2}{x} - 3 = \frac{26}{x}$?

- (1) -8
- (2) $-\frac{1}{8}$
- (3) $\frac{1}{8}$
- (4) 8

19 The diagram below shows right triangle UPC .



Which ratio represents the sine of $\angle U$?

- (1) $\frac{15}{8}$
- (2) $\frac{15}{17}$
- (3) $\frac{8}{15}$
- (4) $\frac{8}{17}$

Use this space for
computations.

20 What is $\sqrt{72}$ expressed in simplest radical form?

(1) $2\sqrt{18}$

(3) $6\sqrt{2}$

(2) $3\sqrt{8}$

(4) $8\sqrt{3}$

21 What is $\frac{6}{5x} - \frac{2}{3x}$ in simplest form?

(1) $\frac{8}{15x^2}$

(3) $\frac{4}{15x}$

(2) $\frac{8}{15x}$

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

22 Which ordered pair is a solution of the system of equations
 $y = x^2 - x - 20$ and $y = 3x - 15$?

(1) $(-5, -30)$

(3) $(0, 5)$

(2) $(-1, -18)$

(4) $(5, -1)$

23 A survey is being conducted to determine which types of television programs people watch. Which survey and location combination would likely contain the most bias?

(1) surveying 10 people who work in a sporting goods store

(2) surveying the first 25 people who enter a grocery store

(3) randomly surveying 50 people during the day in a mall

(4) randomly surveying 75 people during the day in a clothing store

**Use this space for
computations.**

24 The length of a rectangular room is 7 less than three times the width, w , of the room. Which expression represents the area of the room?

(1) $3w - 4$

(3) $3w^2 - 4w$

(2) $3w - 7$

(4) $3w^2 - 7w$

25 The function $y = \frac{x}{x^2 - 9}$ is undefined when the value of x is

(1) 0 or 3

(3) 3, only

(2) 3 or -3

(4) -3, only

26 Which equation represents a line that is parallel to the line $y = 3 - 2x$?

(1) $4x + 2y = 5$

(3) $y = 3 - 4x$

(2) $2x + 4y = 1$

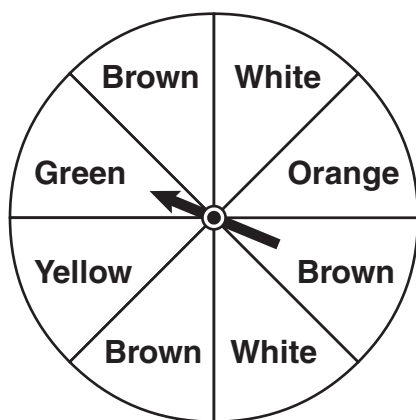
(4) $y = 4x - 2$

Use this space for computations.

27 What is the product of 8.4×10^8 and 4.2×10^3 written in scientific notation?

- (1) 2.0×10^5 (3) 35.28×10^{11}
(2) 12.6×10^{11} (4) 3.528×10^{12}

28 Keisha is playing a game using a wheel divided into eight equal sectors, as shown in the diagram below. Each time the spinner lands on orange, she will win a prize.

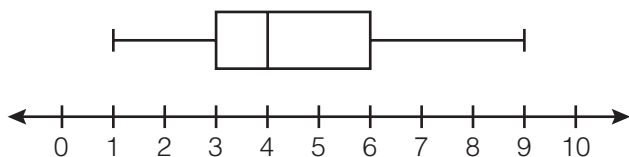


If Keisha spins this wheel twice, what is the probability she will win a prize on *both* spins?

- (1) $\frac{1}{64}$ (3) $\frac{1}{16}$
(2) $\frac{1}{56}$ (4) $\frac{1}{4}$

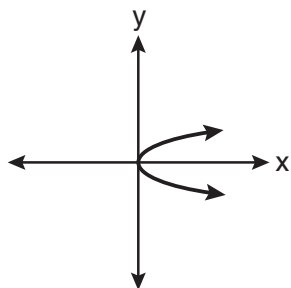
Use this space for
computations.

- 29 A movie theater recorded the number of tickets sold daily for a popular movie during the month of June. The box-and-whisker plot shown below represents the data for the number of tickets sold, in hundreds.

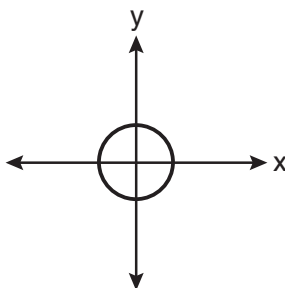


Which conclusion can be made using this plot?

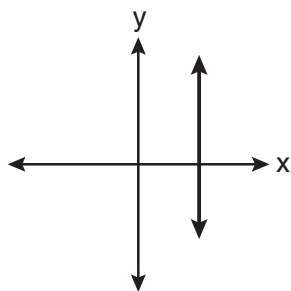
- (1) The second quartile is 600.
 - (2) The mean of the attendance is 400.
 - (3) The range of the attendance is 300 to 600.
 - (4) Twenty-five percent of the attendance is between 300 and 400.
- 30 Which graph represents a function?



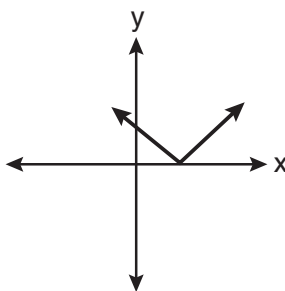
(1)



(3)



(2)

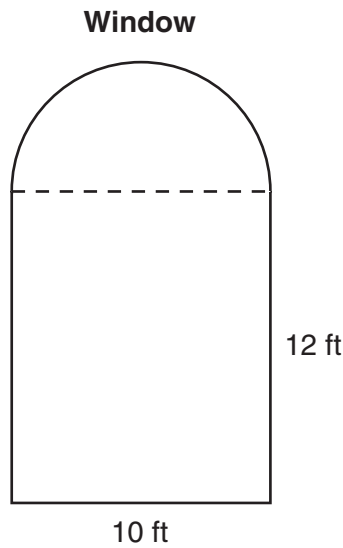


(4)

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 A window is made up of a single piece of glass in the shape of a semicircle and a rectangle, as shown in the diagram below. Tess is decorating for a party and wants to put a string of lights all the way around the outside edge of the window.



To the *nearest foot*, what is the length of the string of lights that Tess will need to decorate the window?

32 Simplify: $\frac{27k^5m^8}{(4k^3)(9m^2)}$

- 33** The table below represents the number of hours a student worked and the amount of money the student earned.

| Number of Hours <i>(h)</i> | Dollars Earned <i>(d)</i> |
|--------------------------------------|-------------------------------------|
| 8 | \$50.00 |
| 15 | \$93.75 |
| 19 | \$118.75 |
| 30 | \$187.50 |

Write an equation that represents the number of dollars, d , earned in terms of the number of hours, h , worked.

Using this equation, determine the number of dollars the student would earn for working 40 hours.

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 Sarah measures her rectangular bedroom window for a new shade. Her measurements are 36 inches by 42 inches. The actual measurements of the window are 36.5 inches and 42.5 inches.

Using the measurements that Sarah took, determine the number of square inches in the area of the window.

Determine the number of square inches in the actual area of the window.

Determine the relative error in calculating the area. Express your answer as a decimal to the nearest *thousandth*.

35 Perform the indicated operation and simplify: $\frac{3x + 6}{4x + 12} \div \frac{x^2 - 4}{x + 3}$

36 A soup can is in the shape of a cylinder. The can has a volume of 342 cm^3 and a diameter of 6 cm. Express the height of the can in terms of π .

Determine the maximum number of soup cans that can be stacked on their base between two shelves if the distance between the shelves is exactly 36 cm. Explain your answer.

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 Solve the following system of equations algebraically:

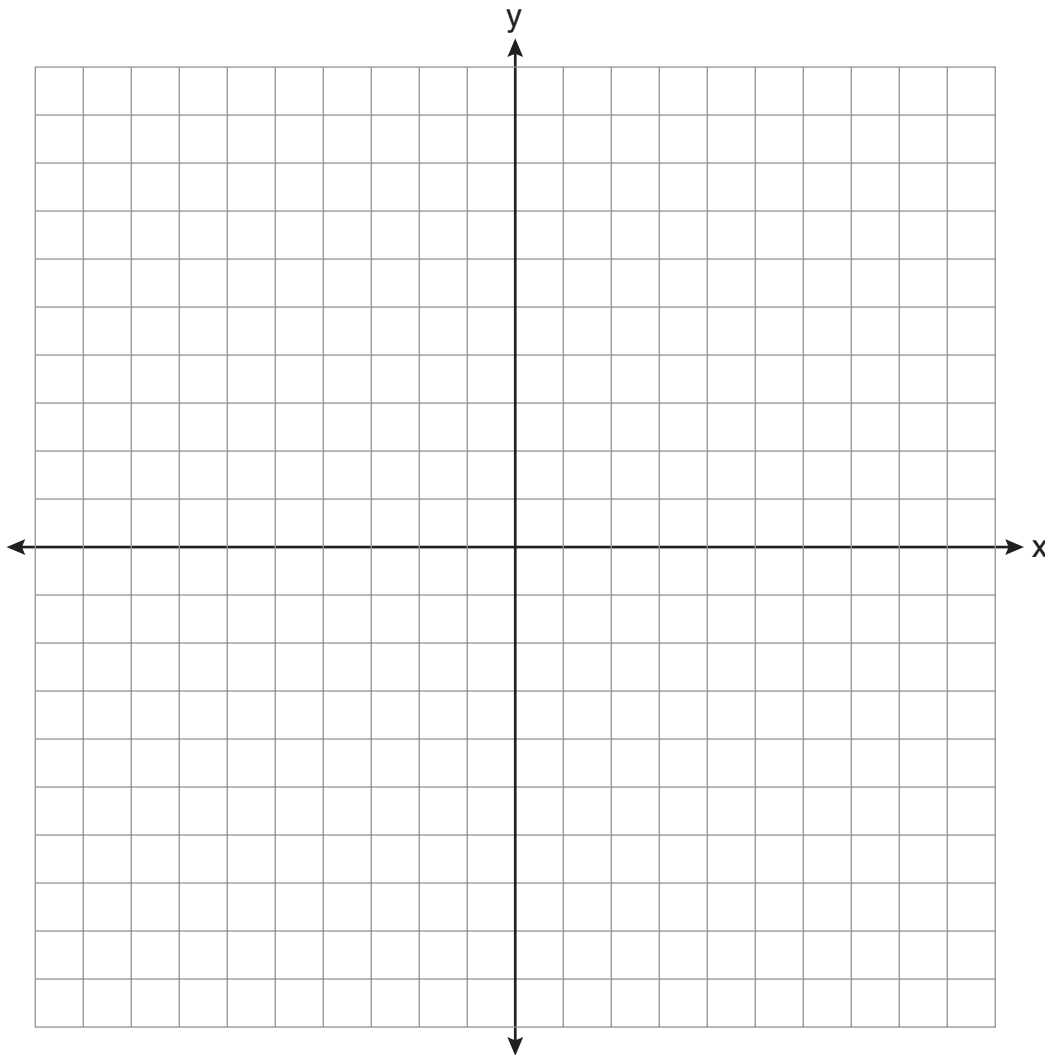
$$3x + 2y = 4$$

$$4x + 3y = 7$$

[Only an algebraic solution can receive full credit.]

38 On the set of axes below, graph the following system of inequalities and state the coordinates of a point in the solution set.

$$\begin{aligned} 2x - y &\geq 6 \\ x &> 2 \end{aligned}$$



39 A restaurant sells kids' meals consisting of one main course, one side dish, and one drink, as shown in the table below.

Kids' Meal Choices

| Main Course | Side Dish | Drink |
|-----------------|--------------|-------|
| hamburger | French fries | milk |
| chicken nuggets | applesauce | juice |
| turkey sandwich | | soda |

Draw a tree diagram or list the sample space showing all possible kids' meals. How many different kids' meals can a person order?

José does not drink juice. Determine the number of different kids' meals that do *not* include juice.

José's sister will eat *only* chicken nuggets for her main course. Determine the number of different kids' meals that include chicken nuggets.

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