

### 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 letter preceding the word or expression that best completes the statement or answers the question. [60]

1. Solve:  $6x + 2 = x + 3$       [A]  $\frac{4}{3}$       [B] 5      [C]  $\frac{1}{5}$       [D]  $-\frac{1}{5}$

[1] \_\_\_\_\_

2. Find the contrapositive of the following statement. If a figure has three sides, it is a triangle.

[A] If a figure is not a triangle, then it does not have three sides.

[B] If a figure does not have three sides, it is a triangle.

[C] If a figure is a triangle, then it does not have three sides.

[D] If a figure has three sides, it is not a triangle.

[2] \_\_\_\_\_

3. Write the standard form of the equation of the line passing through the point  $(3, -3)$  and perpendicular to the line  $5x - 7y = 7$ .

[A]  $5x + 7y = -6$

[B]  $7x + 5y = 6$

[C]  $5x - 7y = 6$

[D]  $-7x - 5y = 6$

[3] \_\_\_\_\_

4. Stanwood Builders has a development of new homes. There are five different floor plans, six exterior colors, and an option of either a one- or a two-car garage. How many choices are there for one home?

[A] 52

[B] 60

[C] 90

[D] 32

[4] \_\_\_\_\_

5. Divide:  $\frac{x^2 - 64}{x + 5} \div (x + 8)$

[A]  $\frac{x+5}{x-8}$

[B]  $\frac{x-8}{x+5}$

[C]  $\frac{x+8}{x+5}$

[D]  $\frac{(x+8)(x-8)}{x+5}$

[5] \_\_\_\_\_

6. Last year a large trucking company delivered about 0.7 million loads of goods at an average value of \$17,500 per load. What was the total value of goods delivered? Express your answer in scientific notation.

[A]  $\$1.225 \times 10^{10}$

[B]  $\$70.0 \times 10^9$

[C]  $\$12.25 \times 10^9$

[D]  $\$7.0 \times 10^{10}$

[6] \_\_\_\_\_

7. Simplify the product:  $(3bc^6)^4(bc)^5$

[A]  $81b^9c^{29}$

[B]  $81b^9c^{11}$

[C]  $3b^9c^{29}$

[D]  $3b^5c^{29}$

[7] \_\_\_\_\_

8. Tell whether  $y$  varies directly as  $x$ . If so, write a function rule for the relationship shown by the data.

$x$	$y$
-7	-24.5
-4	-14
-1	-3.5

[A] yes,  $y = 3.5x$

[B] no

[C] yes,  $y = 17.5x$

[D] yes,  $y = 2.5x$

[8] \_\_\_\_\_

9. Find the measure of one of the interior angles of a regular polygon with five sides.

- [A]  $144^\circ$       [B]  $36^\circ$       [C]  $72^\circ$       [D]  $108^\circ$

[9] \_\_\_\_\_

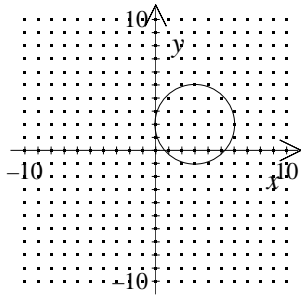
10. If 5 boxes of mints cost \$27.00, how much will 9 boxes of mints cost?

- [A] \$43.20      [B] \$54.00      [C] \$48.60      [D] \$59.40

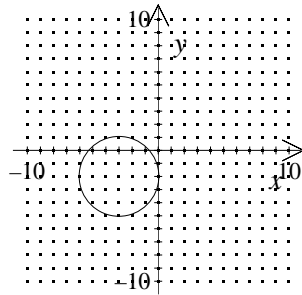
[10] \_\_\_\_\_

11. Sketch the graph of  $(x-3)^2 + (y-2)^2 = 9$

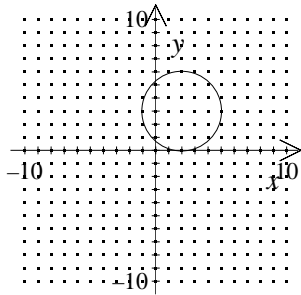
[A]



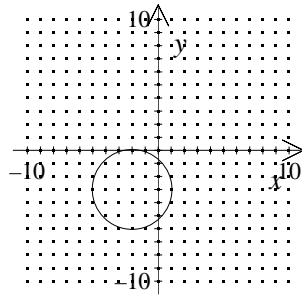
[B]



[C]



[D]



[11] \_\_\_\_\_

12. Solve for  $b$  in the equation  $C = 2a^2b$ .

[A]  $\frac{C}{2a^2}$

[B]  $C - 2a^2$

[C]  $\frac{2a^2}{C}$

[D]  $2a^2 - C$

[12] \_\_\_\_\_

13. Describe the locus of points a distance 2 from a line segment of length 5.

[A] a cylindrical surface with radius 2 and height 5 and two hemispheres with radii 2 and centers at the endpoints of the line segment

[B] a sphere with radius 2      [C] a rectangular solid that is 9 by 4 by 4

[D] a rectangle with length 9 and width 4

[13] \_\_\_\_\_

14. Which of the following square roots is an irrational number?

[A]  $\sqrt{\frac{1}{49}}$

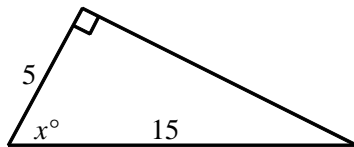
[B]  $-\sqrt{36}$

[C]  $\sqrt{18}$

[D]  $\sqrt{49}$

[14] \_\_\_\_\_

15. Solve for  $x$  to the nearest degree.



[A] 72

[B] 71

[C] 18

[D] 19

[15] \_\_\_\_\_

16. Assume the statement "Cheryl is taking drama or tennis" is true. Which of the following statements must be false?
- [A] Cheryl is taking neither drama, nor tennis.  
 [B] Cheryl is taking only drama.      [C] Cheryl is taking only tennis.  
 [D] Cheryl is taking both drama and tennis.

[16] \_\_\_\_\_

17. Which of these lengths could be the sides of a triangle?

- [A] 15 cm, 20 cm, 3 cm      [B] 20 cm, 15 cm, 4 cm  
 [C] 6 cm, 17 cm, 11 cm      [D] 17 cm, 6 cm, 12 cm

[17] \_\_\_\_\_

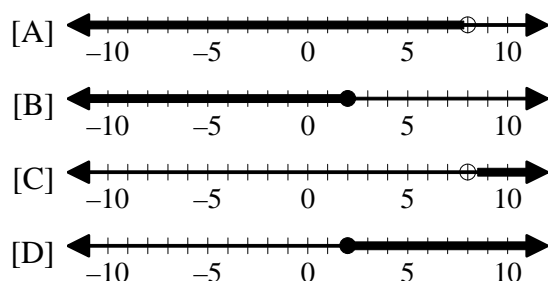
18. What is the area of a circle whose diameter is 12 centimeters?

- [A]  $36\pi \text{ cm}^2$       [B]  $144\pi \text{ cm}^2$       [C]  $12\pi \text{ cm}^2$       [D]  $24\pi \text{ cm}^2$

[18] \_\_\_\_\_

19. Graph:  $x < 8$  or  $x \leq 2$

[19] \_\_\_\_\_



20. Simplify:  $4\sqrt{5} + 3\sqrt{5} - 5\sqrt{5}$

[A] 10

[B]  $12\sqrt{5}$

[C]  $\sqrt{10}$

[D]  $2\sqrt{5}$

[20] \_\_\_\_\_

21. Find the measure, to the nearest tenth, of the diagonal of a rectangle with dimensions 14 cm by 4 cm.

[A] 13.4 cm

[B] 13.5 cm

[C] 4.2 cm

[D] 14.6 cm

[21] \_\_\_\_\_

22. Factor:  $x^2 + 9x + 8$

[A]  $(x + 8)(x + 1)$

[B]  $(x - 8)(x + 1)$

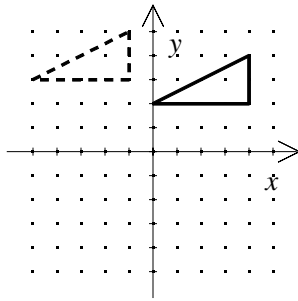
[C]  $(x + 8)(x - 1)$

[D]  $(x - 8)(x - 1)$

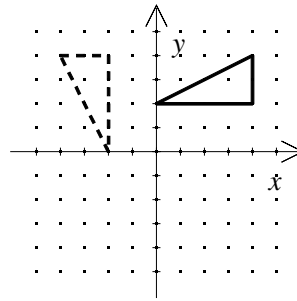
[22] \_\_\_\_\_

23. Which graph represents a translation?

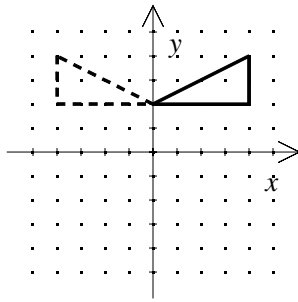
[A]



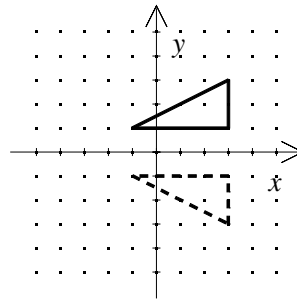
[B]



[C]



[D]



[23] \_\_\_\_\_

24. If the replacement set is the set of integers, find the solution set for the inequality  $x + 7 \geq 9$ .

[A]  $\{2, 3, 4, \dots\}$

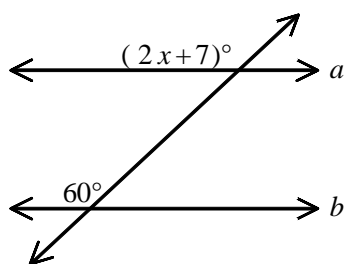
[B]  $\{0, 1, 2, \dots\}$

[C]  $\{2\}$

[D]  $\{16, 17, 18, \dots\}$

[24] \_\_\_\_\_

25. What must be the value of  $x$  for  $a$  to be parallel to  $b$ ?



[A]  $\frac{2}{53}$

[B]  $\frac{67}{2}$

[C]  $\frac{2}{67}$

[D]  $\frac{53}{2}$

[25] \_\_\_\_\_

26. What property is illustrated by the fact that  $(38.5 \cdot 62.1) \cdot 19.9 = 38.5 \cdot (62.1 \cdot 19.9)$ ?

[26] \_\_\_\_\_

[A] associative property for multiplication

[B] zero property for multiplication

[C] commutative property for multiplication

[D] identity property for multiplication

27. If  $\frac{22}{2}$ ,  $\frac{22}{7}$ ,  $\frac{23}{8}$ , and  $\frac{11}{3}$  are placed in order from least to greatest, which would be first?

[A]  $\frac{22}{7}$

[B]  $\frac{22}{2}$

[C]  $\frac{23}{8}$

[D]  $\frac{11}{3}$

[27] \_\_\_\_\_



28. The sales of a brand of sneakers rose from \$2 billion to \$2.7 billion. Find the percent increase to the nearest whole percent.

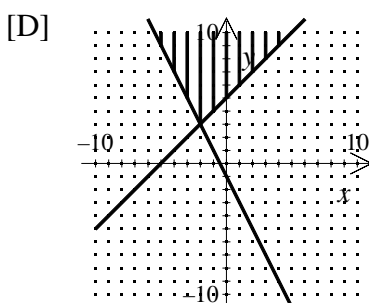
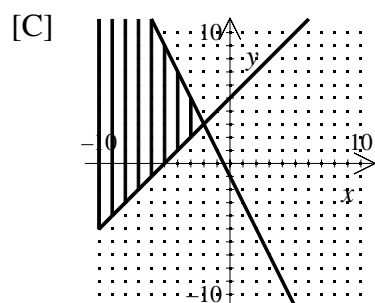
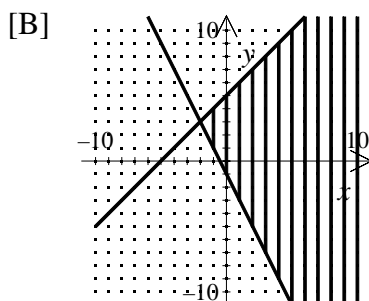
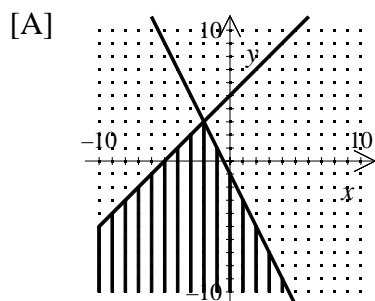
[A] 35%                      [B] 3.5%                      [C] 26%                      [D] 2.6%

[28] \_\_\_\_\_

29. Solve the system graphically:

$$y \geq -2x - 1$$

$$y \geq x + 5$$



[29] \_\_\_\_\_

30. Subtract:  $(-7x^2 + x - 1) - (x^2 - 6x - 6)$

[A]  $-8x^2 - 5x - 7$

[B]  $-8x^2 - 7x + 5$

[C]  $-8x^2 + 7x - 7$

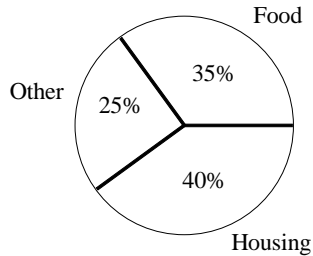
[D]  $-8x^2 + 7x + 5$

[30] \_\_\_\_\_

## 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. [10]

31. The circle graph below represents a family's monthly budget. If the total monthly income is \$2100, how much is spent on food?



[31] \_\_\_\_\_

32. Two cards are drawn in succession and without replacement from a standard deck of 52 cards. How many sets of two cards are possible?

[32] \_\_\_\_\_

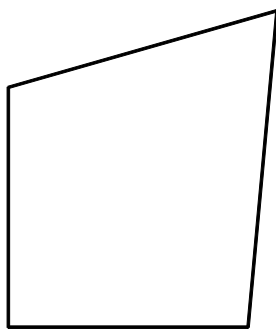
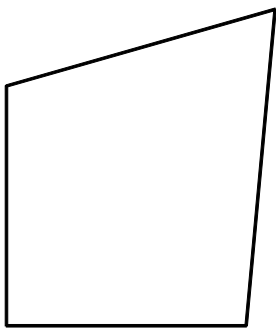
33. Lathisha's test scores are 78, 87, 71, and 77. What score does she need on the last test in order to average 80 on her tests?

[33] \_\_\_\_\_

34. A coin is tossed and a die is rolled. What is the probability that the coin shows tails and the die shows an odd number?

[34] \_\_\_\_\_

35. For the figure below, draw all the lines of symmetry. If there are none, write "none".



[35] \_\_\_\_\_

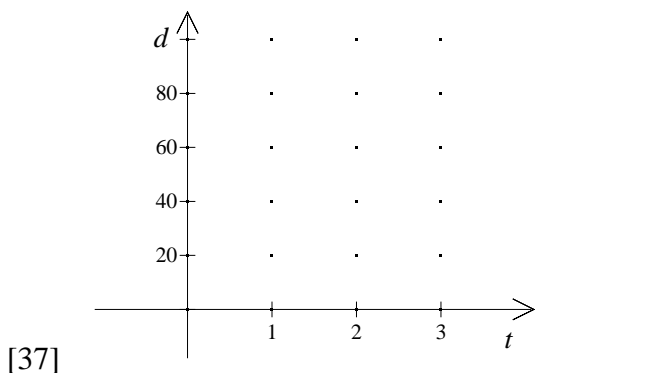
### Part III

**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. [6]**

36. Kaye has \$5.60 in nickels and dimes. She has three times as many dimes as nickels. How many nickels and how many dimes does she have?

[36] \_\_\_\_\_

37. If an object is dropped from a height of 32 feet, the function  $d = -16t^2 + 32$  gives the height of the object after  $t$  seconds. Graph this function. Approximately how long does it take the object to reach the ground ( $d = 0$ )?



#### 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. [8]**

38. The length of a rectangle is 6 feet greater than twice its width. Find the length and width of the rectangle if its area is 108 square feet.

[38] \_\_\_\_\_

39. At the local ballpark, the team charges \$8.50 for each ticket and expects to make \$2040.00 in concessions. The team must pay its players \$3780.00 and pay all other workers \$2220.00. Each fan gets a free bat that costs the team \$2.50 per bat. Write the income and expense equations and find how many tickets must be sold to break even.

[39] \_\_\_\_\_