

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: $4x - 7 = x + 8$ [A] $\frac{1}{5}$ [B] 5 [C] -5 [D] $-\frac{3}{4}$

[1] _____

2. Find the contrapositive of the following statement. If you have sea water, you can make salt.

[A] If you do not have sea water, you can make salt.

[B] If you can't make salt, you do not have sea water.

[C] If you can make salt, you do not have sea water.

[D] If you have sea water, you can't make salt.

[2] _____

3. Write the standard form of the equation of the line passing through the point (2, -4) and perpendicular to the line $3x - 7y = 21$.

[A] $3x - 7y = 22$

[B] $-7x - 3y = 2$

[C] $7x + 3y = 2$

[D] $3x + 7y = -22$

[3] _____

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

[A] 16

[B] 32

[C] 48

[D] 26

[4] _____

5. Divide: $\frac{x^2-36}{x+5} \div (x+6)$

- [A] $\frac{x+6}{x+5}$ [B] $\frac{x+5}{x-6}$ [C] $\frac{(x+6)(x-6)}{x+5}$ [D] $\frac{x-6}{x+5}$

[5] _____

6. Last year a large trucking company delivered about 6 million loads of goods at an average value of \$15,000 per load. What was the total value of goods delivered? Express your answer in scientific notation.

- [A] $\$60.0 \times 10^{10}$ [B] $\$9.0 \times 10^{10}$ [C] $\$6.0 \times 10^{11}$ [D] $\$90.0 \times 10^9$

[6] _____

7. Simplify the product: $(3bc^3)^2(bc)^6$

- [A] $3b^3c^{12}$ [B] $9b^8c^{12}$ [C] $3b^8c^{12}$ [D] $9b^8c^9$

[7] _____

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

x	y
6	44.4
9	64.6
12	88.8

- [A] yes, $y = 7.4x$ [B] yes, $y = 38.4x$
 [C] no [D] yes, $y = 6.4x$

[8] _____

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

[A] 22.5° [B] 135° [C] 45° [D] 157.5°

[9] _____

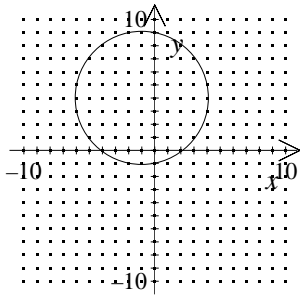
10. If 2 boxes of cherries cost \$13.80, how much will 7 boxes of cherries cost?

[A] \$55.20 [B] \$48.30 [C] \$41.40 [D] \$62.10

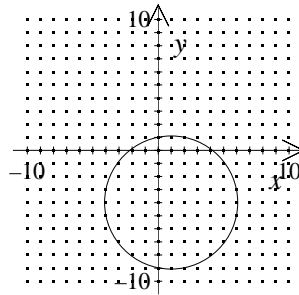
[10] _____

11. Sketch the graph of $(x-4)^2 + (y+1)^2 = 25$

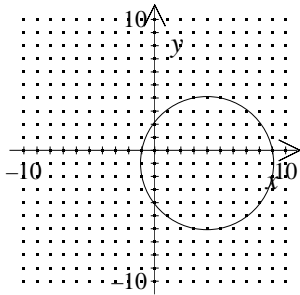
[A]



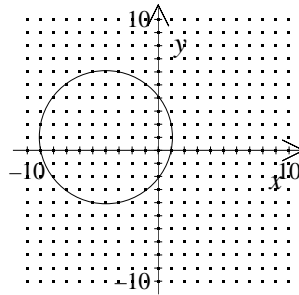
[B]



[C]



[D]



[11] _____

12. Solve for t in the equation $B = 3s^2 + t$.

- [A] $\frac{B}{3s^2}$ [B] $B - 3s^2$ [C] $3s^2 - B$ [D] $\frac{3s^2}{B}$

[12] _____

13. Describe the locus of points in a plane equidistant from two points in that plane.

- [A] two spheres [B] a plane midway between the two points
[C] the perpendicular bisector of the line segment joining the two points
[D] two circles

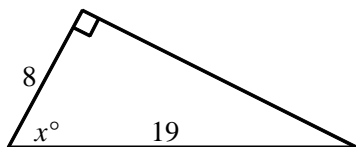
[13] _____

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

- [A] $\sqrt{27}$ [B] $\sqrt{\frac{1}{4}}$ [C] $\sqrt{4}$ [D] $-\sqrt{25}$

[14] _____

15. Solve for x to the nearest degree.



- [A] 67 [B] 23 [C] 65 [D] 25

[15] _____

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

[16] _____

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

- [A] 15 cm, 5 cm, 21 cm [B] 5 cm, 15 cm, 19 cm
[C] 14 cm, 5 cm, 19 cm [D] 4 cm, 15 cm, 21 cm

[17] _____

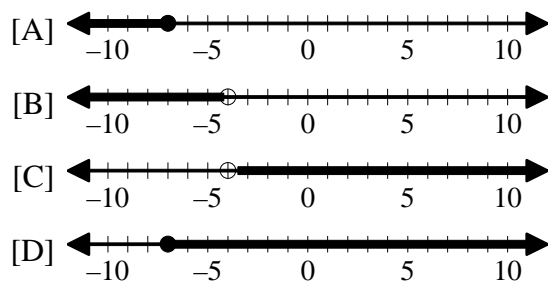
18. What is the area of a circle whose diameter is 10 centimeters?

- [A] $25\pi \text{ cm}^2$ [B] $20\pi \text{ cm}^2$ [C] $10\pi \text{ cm}^2$ [D] $100\pi \text{ cm}^2$

[18] _____

19. Graph: $x > -4$ or $x \geq -7$

[19] _____



20. Simplify: $3\sqrt{7} + 8\sqrt{7} - 3\sqrt{7}$

[A] $14\sqrt{7}$

[B] $\sqrt{56}$

[C] $8\sqrt{7}$

[D] 56

[20] _____

21. Find the measure, to the nearest tenth, of the diagonal of a rectangle with dimensions 10 cm by 5 cm.

[A] 3.9 cm

[B] 12.3 cm

[C] 8.7 cm

[D] 11.2 cm

[21] _____

22. Factor: $x^2 + 10x + 9$

[A] $(x + 1)(x + 9)$

[B] $(x + 1)(x - 9)$

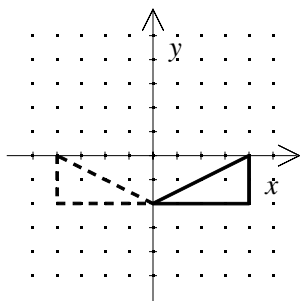
[C] $(x - 1)(x - 9)$

[D] $(x - 1)(x + 9)$

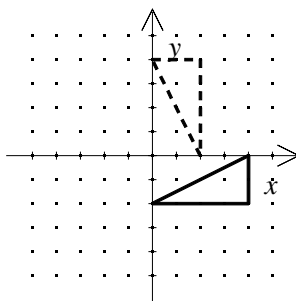
[22] _____

23. Which graph represents a translation?

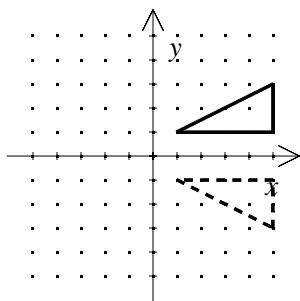
[A]



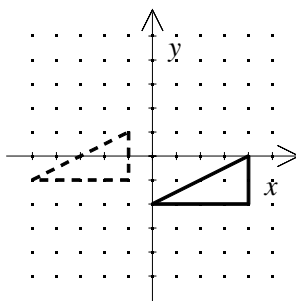
[B]



[C]



[D]



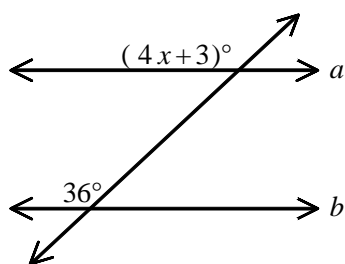
[23] _____

24. If the replacement set is the set of integers, find the solution set for the inequality $x + 4 > 8$.

[A] {5, 6, 7,...} [B] {12, 13, 14,...} [C] {4} [D] {6, 7, 8,...}

[24] _____

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



[A] $\frac{4}{33}$

[B] $\frac{33}{4}$

[C] $\frac{4}{39}$

[D] $\frac{39}{4}$

[25] _____

26. What property is illustrated by the fact that $62.4 \cdot 1 = 62.4$?

[A] associative property for multiplication

[B] commutative property for multiplication

[C] identity property for multiplication

[D] zero property for multiplication

[26] _____

27. If $\frac{12}{5}$, $\frac{15}{8}$, $\frac{25}{6}$, and $\frac{23}{6}$ are placed in order from least to greatest, which would be first?

[A] $\frac{15}{8}$

[B] $\frac{23}{6}$

[C] $\frac{25}{6}$

[D] $\frac{12}{5}$

[27] _____

28. The sales of a brand of sneakers rose from \$4 million to \$4.6 million. Find the percent increase to the nearest whole percent.

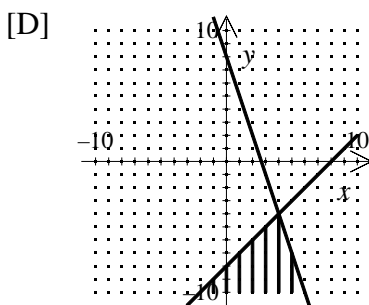
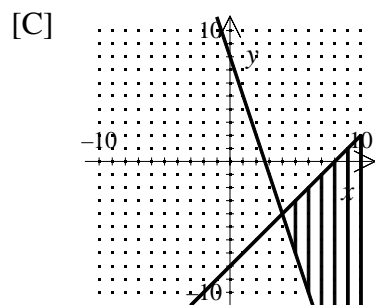
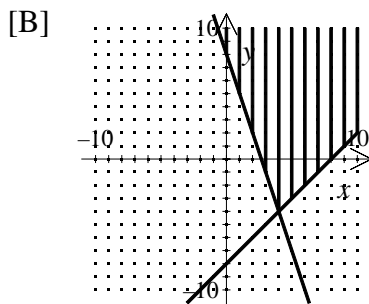
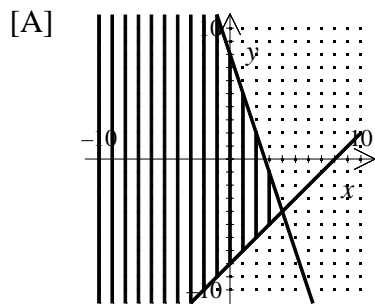
[A] 13% [B] 1.5% [C] 1.3% [D] 15%

[28] _____

29. Solve the system graphically:

$$y \geq -3x + 8$$

$$y \leq x - 8$$



[29] _____

30. Subtract: $(4x^2 - 3x + 1) - (-7x^2 - 2x - 5)$

[A] $11x^2 - 5x - 4$

[B] $11x^2 + x + 6$

[C] $11x^2 - x + 6$

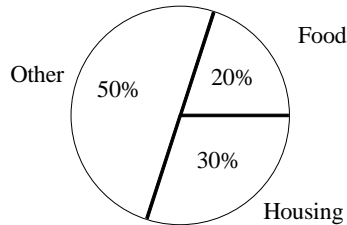
[D] $11x^2 - x - 4$

[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 \$2400, how much is spent on housing?



[31] _____

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

[32] _____

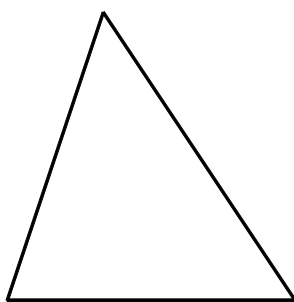
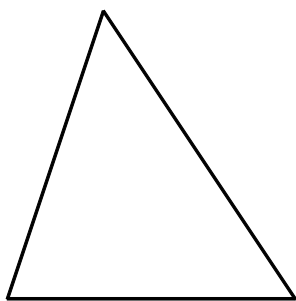
33. Lakita's test scores are 78, 85, 65, and 79. What score does she need on the last test in order to average 80 on her tests?

[33] _____

34. A coin is tossed and a die is rolled. What is the probability that the coin shows heads and the die shows a 1 or a 2?

[34] _____

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



[35] _____

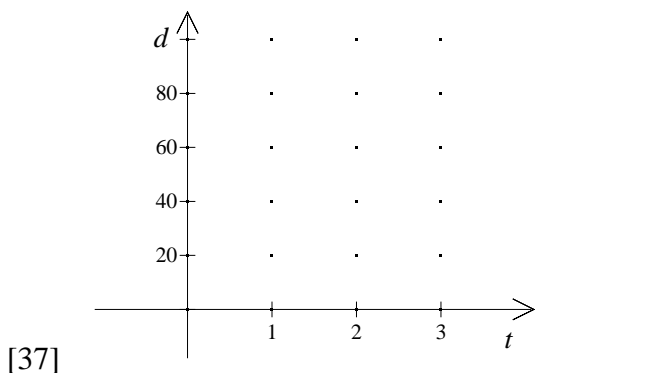
Part III

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. Jane has \$4.20 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 67 feet, the function $d = -16t^2 + 67$ 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 3 feet greater than twice its width. Find the length and width of the rectangle if its area is 44 square feet.

[38] _____

39. At the local ballpark, the team charges \$5.50 for each ticket and expects to make \$1127.50 in concessions. The team must pay its players \$2392.50 and pay all other workers \$907.50. Each fan gets a free bat that costs the team \$2.75 per bat. Write the income and expense equations and find how many tickets must be sold to break even.

[39] _____