

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: $2x - 9 = x + 7$ [A] 16 [B] $\frac{1}{16}$ [C] -16 [D] $-\frac{7}{2}$

[1] _____

2. Find the inverse of the following statement. If he writes in pen, he can't erase it.

[A] If he can't erase it, then he does not write in pen.

[B] If he does not write in pen, he can erase it.

[C] If he writes in pen, he can erase it.

[D] If he does not write in pen, he can't erase it.

[2] _____

3. Write the standard form of the equation of the line passing through the point $(-2, 5)$ and perpendicular to the line $3x - 4y = 20$.

[A] $3x + 4y = 14$

[B] $3x - 4y = -14$

[C] $4x + 3y = 7$

[D] $-4x - 3y = 7$

[3] _____

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

[A] 90

[B] 84

[C] 42

[D] 126

[4] _____

5. Divide: $\frac{x^2-16}{x+8} \div (x-4)$

[A] $\frac{(x-4)(x+4)}{x+8}$ [B] $\frac{x-4}{x+8}$ [C] $\frac{x+4}{x+8}$ [D] $\frac{x+8}{x+4}$

[5] _____

6. Last year a large trucking company delivered about 1 million loads of goods at an average value of \$12,500 per load. What was the total value of goods delivered? Express your answer in scientific notation.

[A] $\$12.5 \times 10^9$ [B] $\$10.0 \times 10^{10}$ [C] $\$1.0 \times 10^{11}$ [D] $\$1.25 \times 10^{10}$

[6] _____

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

[A] $4s^8t^{20}$ [B] $4s^4t^{20}$ [C] $64s^8t^{20}$ [D] $64s^8t^{10}$

[7] _____

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

x	y
9	54.9
11	67.1
13	79.3

[A] yes, $y = 5.1x$

[B] no

[C] yes, $y = 6.1x$

[D] yes, $y = 45.9x$

[8] _____

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

- [A] 30° [B] 165° [C] 150° [D] 15°

[9] _____

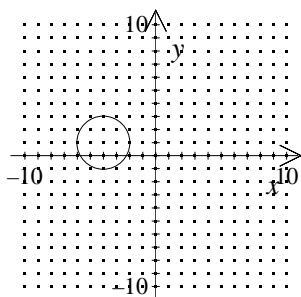
10. If 5 cans of apricots cost \$31.50, how many cans of apricots can be purchased with \$56.70?

- [A] 9 [B] 10 [C] 11 [D] 8

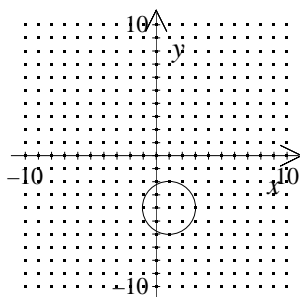
[10] _____

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

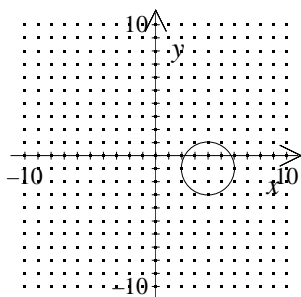
[A]



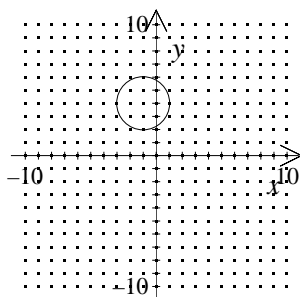
[B]



[C]



[D]



[11] _____

12. Solve for y in the equation $T = 9x^2 + y$.

- [A] $9x^2 - T$ [B] $T - 9x^2$ [C] $\frac{9x^2}{T}$ [D] $\frac{T}{9x^2}$

[12] _____

13. Describe the locus of points
in a plane a distance 6 from line m in that plane.

- [A] two planes a distance 6 from line m
[B] a cylinder with line m in the center
[C] a sphere with line m as the diameter
[D] two parallel lines parallel to and a distance 6 from line m

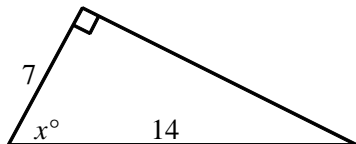
[13] _____

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

- [A] $\sqrt{29}$ [B] $\sqrt{\frac{1}{64}}$ [C] $\sqrt{64}$ [D] $-\sqrt{4}$

[14] _____

15. Solve for x to the nearest degree.



- [A] 60 [B] 63 [C] 30 [D] 27

[15] _____

16. Assume the statement "Michael is taking sociology and biology" is true.
Which of the following statements must be true?
- [A] Michael is taking both sociology and biology.
[B] Michael is taking only biology.
[C] Michael is taking neither sociology, nor biology.
[D] Michael is taking only sociology.

[16] _____

17. Which of these lengths could be the sides of a triangle?
- [A] 13 cm, 10 cm, 24 cm [B] 6 cm, 8 cm, 14 cm
[C] 9 cm, 13 cm, 24 cm [D] 8 cm, 7 cm, 14 cm

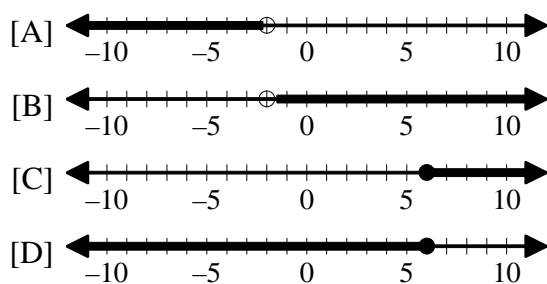
[17] _____

18. What is the area of a circle whose diameter is 14 centimeters?
- [A] $49\pi \text{ cm}^2$ [B] $196\pi \text{ cm}^2$ [C] $14\pi \text{ cm}^2$ [D] $28\pi \text{ cm}^2$

[18] _____

19. Graph: $x > -2$ or $x \geq 6$

[19] _____



20. Simplify: $6\sqrt{2} + 2\sqrt{2} - 2\sqrt{2}$

[A] $6\sqrt{2}$

[B] 12

[C] $10\sqrt{2}$

[D] $\sqrt{12}$

[20] _____

21. Find the measure, to the nearest tenth, of the diagonal of a rectangle with dimensions 16 cm by 14 cm.

[A] 21.3 cm

[B] 22.4 cm

[C] 5.5 cm

[D] 7.7 cm

[21] _____

22. Factor: $x^2 - 11x + 30$

[A] $(x - 5)(x + 6)$

[B] $(x - 5)(x - 6)$

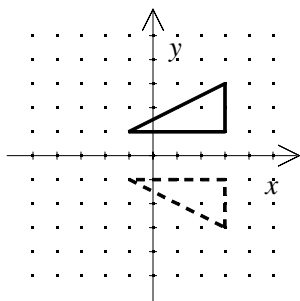
[C] $(x + 5)(x - 6)$

[D] $(x + 5)(x + 6)$

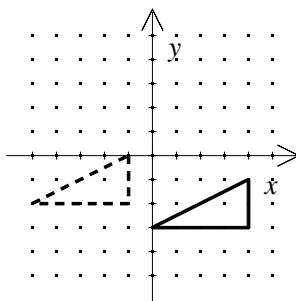
[22] _____

23. Which graph represents a translation?

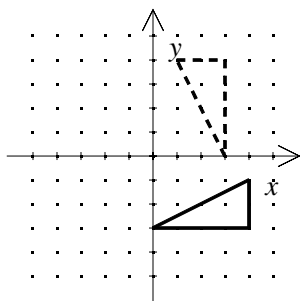
[A]



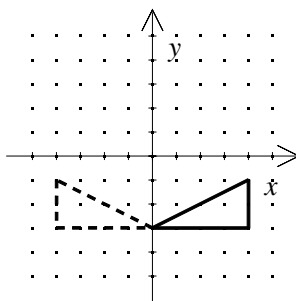
[B]



[C]



[D]



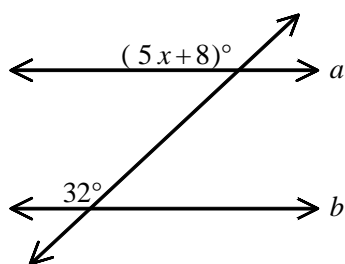
[23] _____

24. If the replacement set is the set of integers, find the solution set for the inequality $x + 8 > 9$.

[A] {17, 18, 19,...} [B] {1} [C] {2, 3, 4,...} [D] {3, 4, 5,...}

[24] _____

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



- [A] $\frac{24}{5}$ [B] $\frac{1}{8}$ [C] $\frac{5}{24}$ [D] 8

[25] _____

26. What property is illustrated by the fact that $(86.9 \cdot 2.3) \cdot 0 = 0$?

- [A] identity property for multiplication
[B] associative property for multiplication
[C] commutative property for multiplication
[D] zero property for multiplication

[26] _____

27. If $\frac{11}{6}$, $\frac{16}{4}$, $\frac{15}{5}$, and $\frac{22}{4}$ are placed in order from least to greatest, which would be first?

- [A] $\frac{22}{4}$ [B] $\frac{15}{5}$ [C] $\frac{11}{6}$ [D] $\frac{16}{4}$

[27] _____

28. The sales of a brand of sneakers rose from \$5 million to \$5.5 million. Find the percent increase to the nearest whole percent.

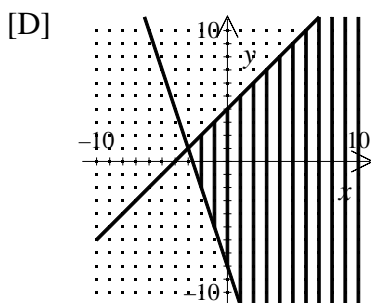
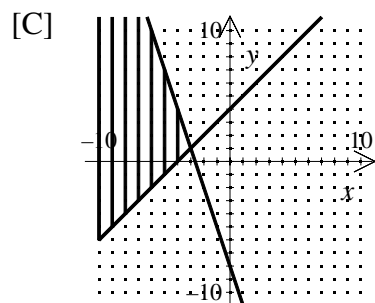
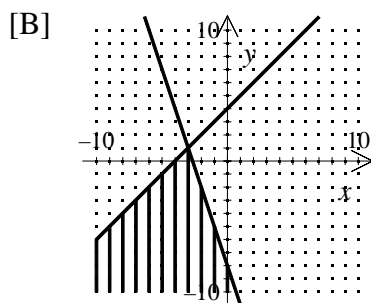
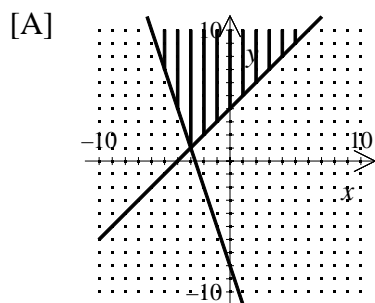
[A] 1.0% [B] 10% [C] 0.9% [D] 9%

[28] _____

29. Solve the system graphically:

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

$$y \leq x + 4$$



[29] _____

30. Subtract: $(-5x^2 + 4x + 2) - (-3x^2 - 8x - 1)$

[A] $-2x^2 + 12x + 1$

[B] $-2x^2 - 4x + 1$

[C] $-2x^2 + 12x + 3$

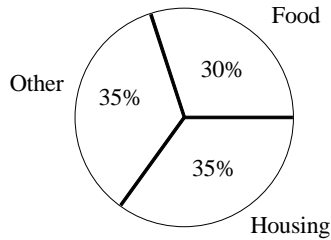
[D] $-2x^2 - 12x + 3$

[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 \$2000, how much is spent on housing?



[31] _____

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

[32] _____

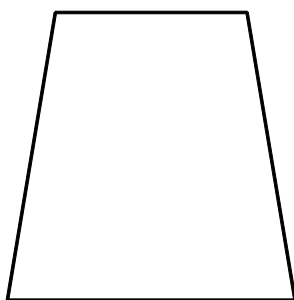
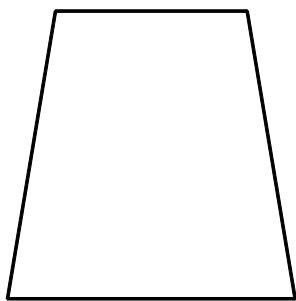
33. Jewel's test scores are 86, 94, 83, and 91. What score does she need on the last test in order to average 90 on her tests?

[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 3 or a 4?

[34] _____

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



[35] _____

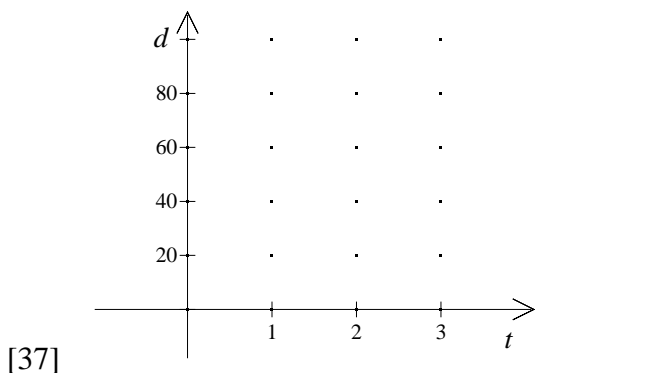
Part III

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. Sara has \$3.50 in nickels and dimes. She has twice 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 98 feet, the function $d = -16t^2 + 98$ 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 4 feet greater than four times its width. Find the length and width of the rectangle if its area is 120 square feet.

[38] _____

39. At the local ballpark, the team charges \$6.00 for each ticket and expects to make \$750.00 in concessions. The team must pay its players \$1875.00 and pay all other workers \$1500.00. Each fan gets a free bat that costs the team \$3.50 per bat. Write the income and expense equations and find how many tickets must be sold to break even.

[39] _____