

Student Name: _____

Teacher Name: _____

Office of Catholic Schools

Algebra I

Section 2 – No Calculator

Student Booklet

45 Minutes

MATH TEST – MULTIPLE CHOICE

26 Questions

DIRECTIONS: Solve each problem, choose the correct answer, and then fill in the corresponding oval on your answer document.

You are NOT allowed to use a calculator for this section of the test.

DO YOUR FIGURING HERE.

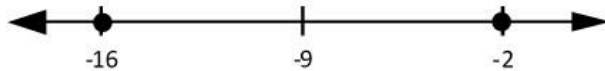
28. If $f(x) = 4x^2 - 15$, then $f(3) = ?$

- A. -51
- B. -3
- C. 21
- D. 27

29. If $f(x) = x^2 - 2x + 4$ for all values of x , what is the value of $f(x-3)$?

- A. $x^2 - 8x + 19$
- B. $x^2 - 8x + 13$
- C. $x^2 - 8x + 7$
- D. $x^2 - 2x + 4$

30.

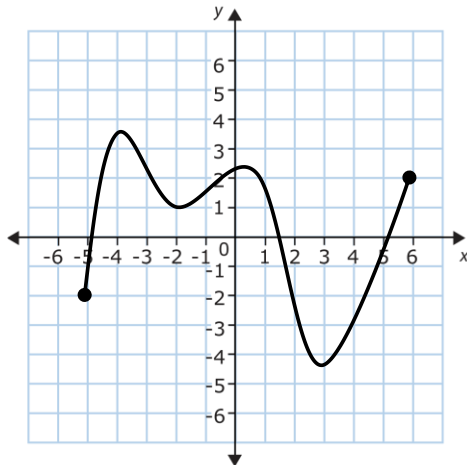


Which of the following equations describes the number line above?

- A. $|x - 7| = 9$
- B. $|x + 7| = 9$
- C. $|x - 9| = 7$
- D. $|x + 9| = 7$

DO YOUR FIGURING HERE.

31. The complete graph of function g is shown in the standard (x, y) coordinate plane below. What is the x value of the minimum of $g(x)$?

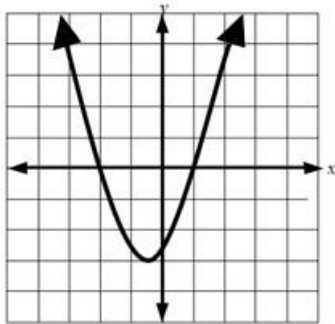


- A. -5
- B. -4
- C. 3
- D. 4

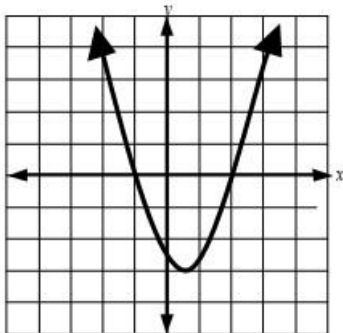
DO YOUR FIGURING HERE.

32. The range of the polynomial function f is the set of real numbers greater than or equal to -3 . If the zeros of f are -2 and 1 , which of the following could be the graph of $y = f(x)$ in the xy -plane?

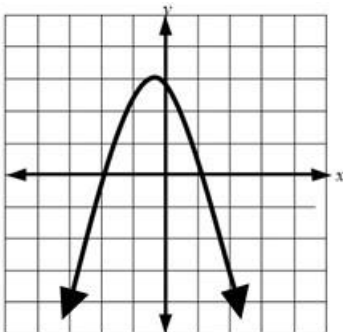
A.



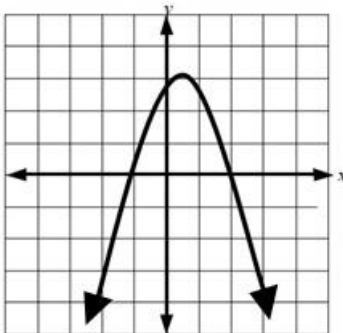
B.



C.

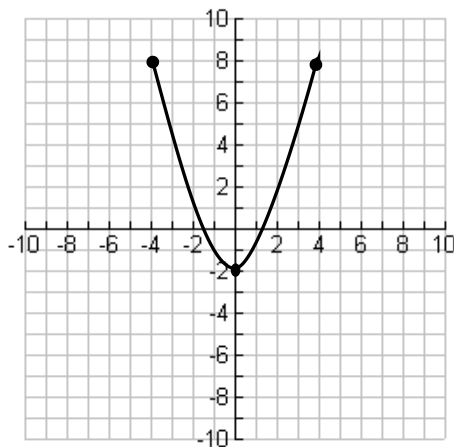


D.



DO YOUR FIGURING HERE.

33. What is the range of the following function?



- A. $\{x: 0 \leq x \leq -2\}$
B. $\{x: -4 \leq x \leq 4\}$
C. $\{y: -4 \leq y \leq 4\}$
D. $\{y: -2 \leq y \leq 8\}$
34. Given the following points on the function $h(x)$, which value(s) should be in the domain?

$$\{(-2, 8), (0, 8), (2, 8), (4, 8), (6, 8), (8, 8)\}$$

- A. $\{x: -2 \leq x \leq 8\}$
B. $\{y: -2 \leq y \leq 8\}$
C. $\{x: x = 8\}$
D. $\{y: y = 8\}$
35. The equation $f(x) = x^2$ is graphed in the standard (x, y) coordinate plane. What is the proper translation to $f(x) = (x - 3)^2 + 2$?

- A. Right 2 units, up 3 units
B. Right 3 units, up 2 units
C. Left 2 units, down 3 units
D. Left 3 units, down 2 units

DO YOUR FIGURING HERE.

36. For all nonzero values of x , $\frac{15x^6+35x^9}{5x^3} = ?$

- A. $3x^2 + 7x^3$
- B. $3x^2 + 7x^6$
- C. $3x^3 + 7x^3$
- D. $3x^3 + 7x^6$

37. $\sqrt{3a^2 + 6} - x = 0$

If $a > 0$ and $x = 9$ in the equation above, what is the value of a ?

- A. 3
- B. 4
- C. 5
- D. 9

38. If $\frac{a^x}{a^y} = a^{3/4}$ for which all $a \neq 0$, which of the following must be true?

- A. $x - y = 3/4$
- B. $x + y = 3/4$
- C. $x \div y = 3/4$
- D. $x \times y = 3/4$

DO YOUR FIGURING HERE.

39. Which expression is another way to write $x^{5/2}$?

- A. $5x + 2$
- B. $\sqrt{x^5}$
- C. $\sqrt[5]{x^2}$
- D. $2x - 5$

40. Which expression is equivalent to $\sqrt[3]{a^6b^{12}}$?

- A. a^2b^4
- B. a^3b^6
- C. a^3b^9
- D. a^9b^{15}

41. Which expression is equivalent to $(9x)^{3/2}$?

- A. $3x\sqrt{x}$
- B. $6\sqrt[3]{x^2}$
- C. $9\sqrt[3]{x^2}$
- D. $27x\sqrt{x}$

42. Simplify the following expression.

$$\sqrt[3]{16r^5s^6}$$

- A. $2rs^2\sqrt[3]{r^2}$
- B. $2rs^2\sqrt[3]{2r^2}$
- C. $2r^2s\sqrt[3]{2r^2s^2}$
- D. $8r^2s^3$

DO YOUR FIGURING HERE.

43. What is the value of the following expression?

$$\sqrt{45} + \sqrt{125}$$

- A. $4\sqrt{5}$
- B. $8\sqrt{3}$
- C. $8\sqrt{5}$
- D. $\sqrt{170}$

44. Simplify the following expression?

$$(\sqrt[3]{x^2})(\sqrt[3]{x^4})$$

- A. x
- B. x^2
- C. $2x^2$
- D. $3x^6$

45. $(-8x^2y + 4xy^2 - 6y^2) + (x^2y - 4y^2 + 9xy^2)$

Which of the following is equivalent to the expression above?

- A. $-9x^2y + 8xy^2 - 15y^2$
- B. $-9x^2y - 5xy^2 - 2y^2$
- C. $-7x^2y + 8xy^2 - 15y^2$
- D. $-7x^2y + 13xy^2 - 10y^2$

46. The width of a rectangle is 5 inches longer than the length. What expression gives the perimeter in inches?

- A. $2w - 5$
- B. $4w - 10$
- C. $4w + 20$
- D. $4w - 20$

DO YOUR FIGURING HERE.

47. Which of the following is an equivalent form of the expression $12x + 15xy$?

- A. $27x^2y$
- B. $27(2x + y)$
- C. $3x(4 + 5y)$
- D. $12x(15xy)$

48. Which of the following is an equivalent form of the expression below?

$$36x^4 - 121y^2$$

- A. $(6x + 11y)(6x - 11y)$
- B. $(6x^2 + 11y)(6x^2 - 11y)$
- C. $(6x + 11y^2)(6x - 11y^2)$
- D. $(6x^2 - 11y)^2$

49. Which of the following is an equivalent form of the expression below?

$$25z^2 - 64t^2$$

- A. $(5z + 8t)(5z - 8t)$
- B. $(5z^2 + 8t^2)(5z^2 - 8t^2)$
- C. $(5z + 8t)^2$
- D. $(5z^2 - 8t)^2$

50. Factor the following trinomial completely.

$$15x^2 - 39x + 18$$

- A. $(3x - 3)(5x - 6)$
- B. $(5x - 9)(3x - 2)$
- C. $3(5x - 3)(x - 2)$
- D. $3(5x - 2)(x - 3)$

DO YOUR FIGURING HERE.

51. If $R = \frac{1}{6}s(2t - u)$, solve for u in terms of R , s , and t ?

A. $u = 2t - R - s$

B. $u = 2t - \frac{R}{s}$

C. $u = 2t - 6\frac{R}{s}$

D. $u = 2t - 6R - s$

52. Which of the following is an equivalent expression of $\frac{6x^3y^{-2}z^{-1}}{16x^7y^{-5}z^4}$?

A. $\frac{3y^7}{8x^{10}z^5}$

B. $\frac{3y^3}{8x^4z^5}$

C. $\frac{3y^3}{8x^{10}z^5}$

D. $\frac{3y^7}{8x^{10}z^3}$

53. If g is any even integer, for $g \neq 7, -7$, simplify the following.

$$\frac{g-7}{g^2-49} \div \frac{1}{g+7} ?$$

A. 1

B. 2

C. $\frac{1}{g^2 - 49}$

D. $\frac{2}{(g + 7)^2}$

DO YOUR FIGURING HERE.

STUDENT NAME _____

SCHOOL _____

MATH TEST – SHORT RESPONSE*2 Questions*

DIRECTIONS: Solve each problem. Clearly show all steps, including appropriate formulas, substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer but with no work shown will receive only partial credit.

You are NOT allowed to use a calculator for this section of the test.

1. PROMPT:

Given the following ordered pairs $(-4, -1)$, and $(4, 5)$

- a. Using slope formula, find the slope of the given line. Show all work.

Slope =

- b. Write the equation of the line, in point-slope form, that is perpendicular to the given line and passes through the point $(-4, -1)$.

Line Equation:

- c. Find the x-intercept, $(a, 0)$, of the line found in part (b). Show all work.

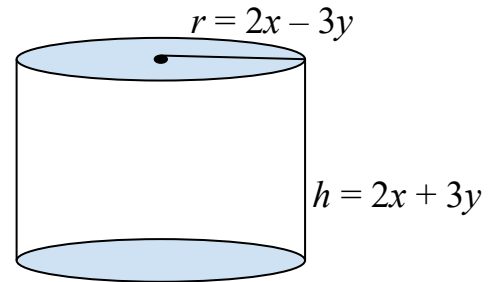
x-intercept = _____ feet

DO YOUR FIGURING HERE.

2. PROMPT:

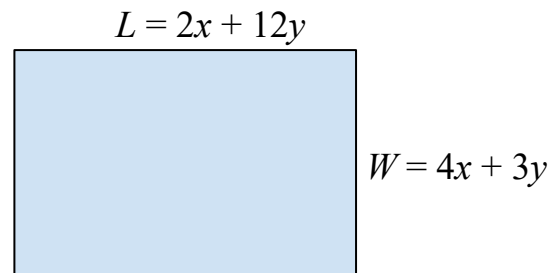
Simplify all algebraic expressions

- a. Determine the algebraic expression for volume in simplest form, using the formula for volume of a cylinder, $V = \pi r^2 h$ (leave answer in terms of the symbol π rather than the numeric value).



Volume: $V =$

- b. Find the algebraic expression for the perimeter of the rectangle. Simplify the answer.



Perimeter =

- c. If the value of perimeter is 216, and y is two times the value of x , what is the value of x , y , and the area?

$x =$ $y =$ Area =