

Student Name: _____

Teacher Name: _____

Office of Catholic Schools

Algebra I

Section 1 – Calculator Allowed

Student Booklet

45 Minutes

MATH TEST – MULTIPLE CHOICE

27 Questions

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

You are allowed to use a calculator for this section of the test. You may use a calculator for any problems you choose, but some of the problems may best be done without using a calculator.

DO YOUR FIGURING HERE.

1. What is the value of $a^3 - 2b^2 + c$ when $a = 2$, $b = -3$ and $c = 5$?

- A. -5
- B. 2
- C. 23
- D. 31

2.
$$3x + \frac{1}{3}x + 9 = \frac{1}{3}(10x + 9)$$

Which of the following describes the solution to the equation above?

- A. $x = 0$
- B. $x = 9$
- C. The equation has no solutions.
- D. There are an infinite number of solutions.

3. Solve the inequality $2x - 7 \geq 9x + 28$.

- A. $x \geq -5$
- B. $x \leq -5$
- C. $x \geq -1$
- D. $x \leq 1$

DO YOUR FIGURING HERE.

4.

$$A = \frac{B}{C-2B}$$

Solve the equation for B in terms of A and C ?

A. $B = \frac{AC}{3}$

B. $B = \frac{A}{C-2A}$

C. $B = \frac{AC}{1+2A}$

D. $B = \frac{A}{2C+A}$

5.

$$4x - 5 \leq y(8x - 10)$$

In the inequality above, y is a constant. For what value of y does the equation have an infinite number of solutions?

A. $\frac{1}{2}$

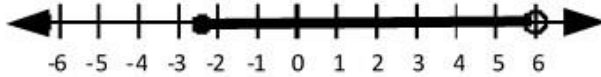
B. 2

C. 4

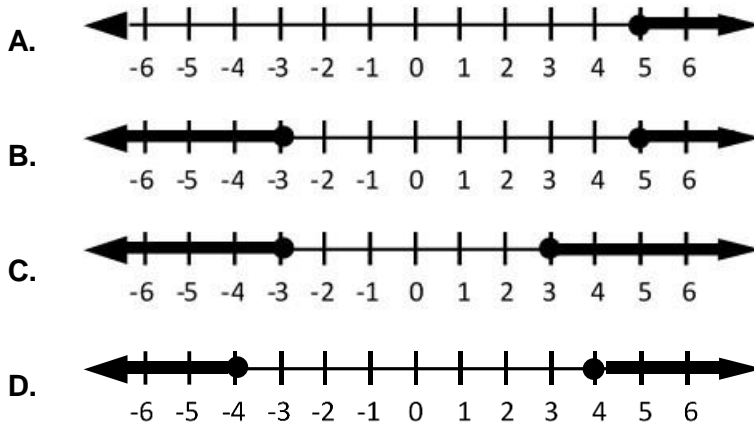
D. 5

DO YOUR FIGURING HERE.

6. Which of the following logical statements describes the set of values of x graphed on the real number line shown below?



- A. $(-2\frac{1}{2}, 6)$
 B. $[-2\frac{1}{2}, 6)$
 C. $(-2\frac{1}{2}, 6]$
 D. $[-2\frac{1}{2}, 6]$
7. What is the solution set of $|3m - 3| \geq 12$?

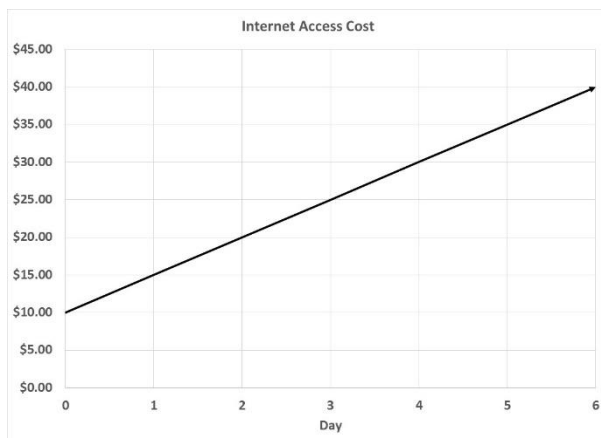


DO YOUR FIGURING HERE.

8. What is the slope of the line in the xy -plane that passes through points $(-\frac{3}{2}, -5)$ and $(3, \frac{5}{2})$?

- A. $-\frac{3}{5}$
B. $-\frac{5}{3}$
C. $\frac{3}{5}$
D. $\frac{5}{3}$

9. The cost function shown in the graph below shows the cost for internet access per day. It has two components: a fixed cost, plus a constant cost per day. Based on the graph, what is the fixed cost for internet access?



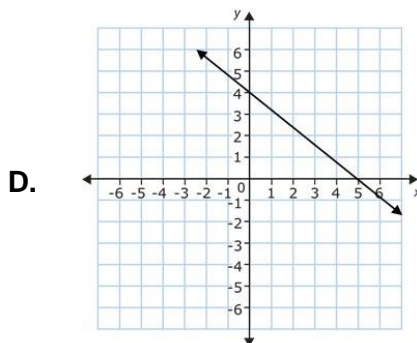
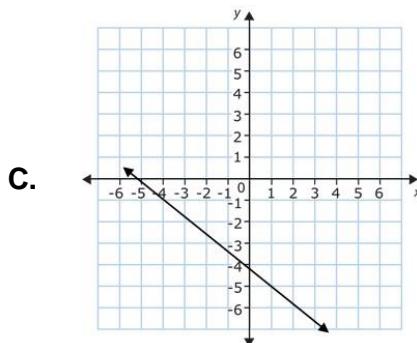
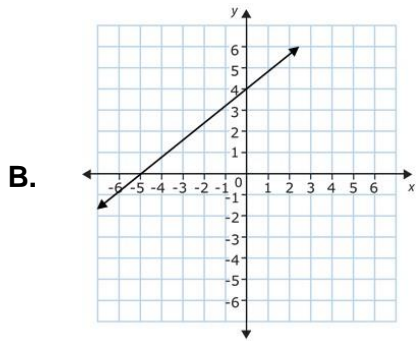
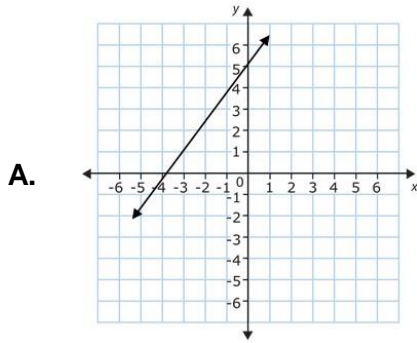
- A. \$0.00
B. \$5.00
C. \$10.00
D. \$15.00

DO YOUR FIGURING HERE.

10. $C = 20 + 12.50m$
Julia is going to subscribe to Netflix. She uses the above equation to estimate the cost, C , she owes when she subscribes for m months. Based on the equation, what is the total cost that she spends for the first six months of her subscription?
- A. 32.50
 - B. 75.00
 - C. 95.00
 - D. 132.50
11. Leo rode his bike to the park. The trip to the park took m minutes. Returning home he was tired and the trip took 10 minutes longer than the ride to the park. Which of the following is an expression for the total number of minutes he spent riding his bike?
- A. $m - 10$
 - B. $2m$
 - C. $2m - 10$
 - D. $2m + 10$

DO YOUR FIGURING HERE.

12. Which of the following is the graph of the line in the xy coordinate plane with the equation $y = -\frac{4}{5}x + 4$?



DO YOUR FIGURING HERE.

13. What is the point-slope equation of the line in the xy -plane that passes through the origin and point $(6, 12)$?

- A. $y - 12 = 2(x - 6)$
- B. $y - 12 = (x - 6)$
- C. $y = \frac{1}{2}x$
- D. $y = x + 6$

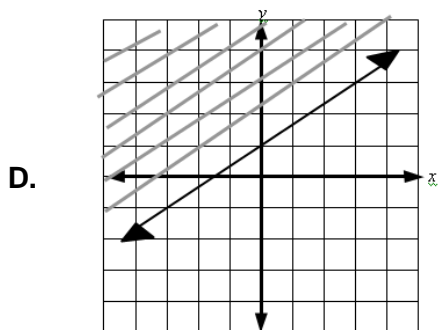
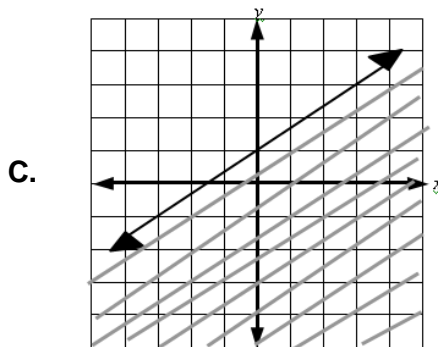
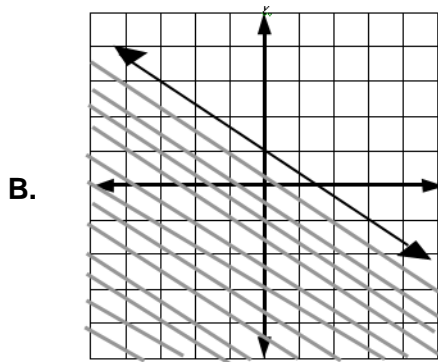
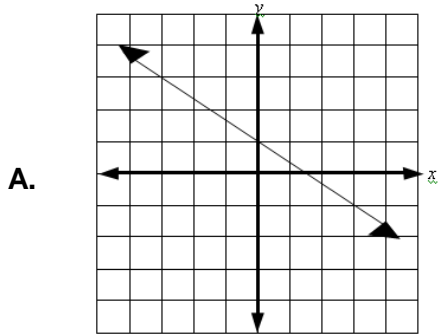
14.
$$ax - y = 8$$
$$5x - 10y = 80$$

What value of a will result in a system of parallel lines?

- A. $\frac{1}{2}$
 - B. 1
 - C. 2
 - D. 5
15. What is the slope of any line parallel to the line $y = 1$ in the standard (x, y) coordinate plane?
- A. -1
 - B. 0
 - C. 1
 - D. Undefined

DO YOUR FIGURING HERE.

16. Which of the following is the graph of the inequality $4x + 6y \leq 6$?



DO YOUR FIGURING HERE.

17. What is the value of x in the solution to the following system of equations?

$$x + 3y + 12 = 37$$

$$2x + y = 15$$

- A. 1
B. 3
C. 4
D. 7
18. A dog fostering program sponsors a total of 45 dogs who are either 15 pounds or 50 pounds. The sum of the dogs' weight is 1,305 pounds. Which system of equations could be used to find the number of 50 pound dogs sponsored by the dog fostering program?

A. $x + y = 45$
 $50x + 50y = 1,305$

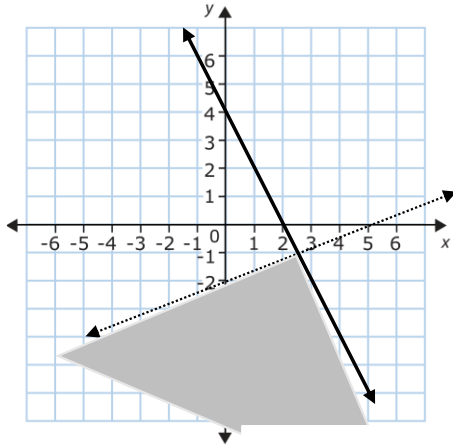
B. $x + y = 45$
 $50x - 15y = 1,305$

C. $x + y = 50$
 $15x + 45y = 1,305$

D. $x + y = 45$
 $15x + 50y = 1,305$

DO YOUR FIGURING HERE.

19. The shaded portion of the graph in the standard (x, y) coordinate plane below represents the solution set of which of the following systems of inequalities?



- A. $y \geq -2x + 4$
 $y > \frac{2}{5}x - 2$
- B. $y \geq -2x + 4$
 $y < \frac{2}{5}x - 2$
- C. $y \leq -2x + 4$
 $y > \frac{2}{5}x - 2$
- D. $y \leq -2x + 4$
 $y < \frac{2}{5}x - 2$

DO YOUR FIGURING HERE.

20. A line in the xy -plane has the points in the table.

x	-3	0	2	5
y	-11	-5	-1	5

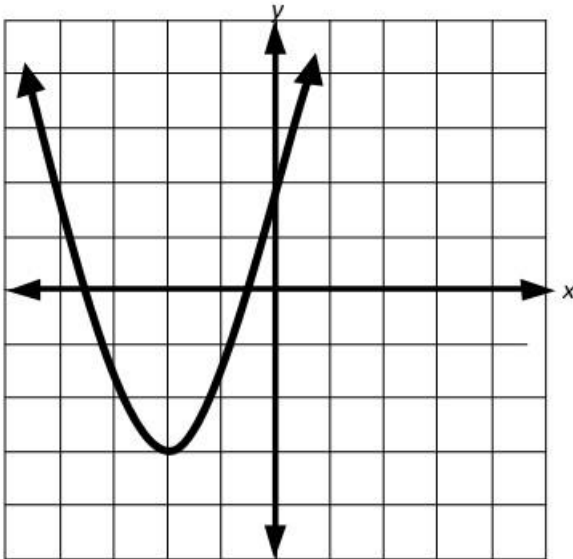
Line a has the equation $y = \frac{2}{3}x + 7$.

What is the intersection of the two lines?

- A. $(-3, -11)$
 - B. $(6, 1)$
 - C. $(9, 13)$
 - D. The two lines do not intersect.
21. Which equation should be paired with $2x - 3y = 4$ to form a system that has no solutions?
- A. $4x - 6y = 5$
 - B. $-6x - 9y = -12$
 - C. $3x - 2y = -4$
 - D. $x = 4$

DO YOUR FIGURING HERE.

22. What is the axis of symmetry of the following function?

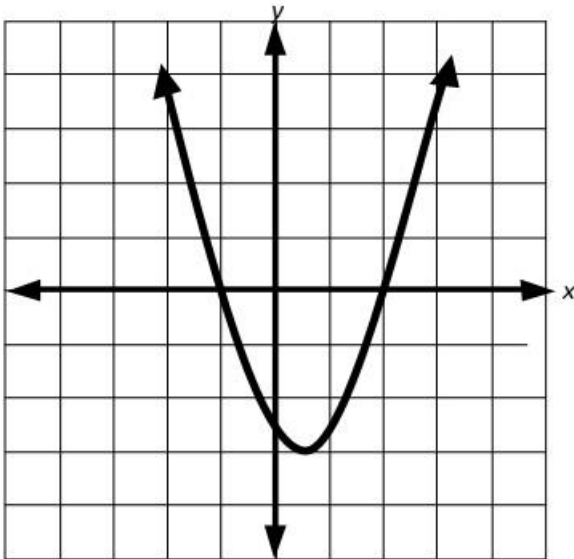


- A. $x = 0$
B. $y = 0$
C. $x = -2$
D. $y = -3$
23. The function g is defined by $g(x) = (x + 8)(x - 3)$. The graph of g in the xy -plane is a parabola. Which of the following intervals contains the x -coordinate of the vertex of the graph of g ?

- A. $-8 < x < -3$
B. $-3 < x < 8$
C. $3 < x < 8$
D. $4 < x < 6$

DO YOUR FIGURING HERE.

24. What are the roots of the function in the graph below?



- A. $x = -1, x = 2$
B. $x = -1, x = 0, x = 2$
C. $x = -1, x = 0$
D. $x = 0, x = 2$
25. What is the sum of the solutions of the equation

$$2x^2 - x - 21 = 0 ?$$

- A. $-\frac{13}{2}$
B. $-\frac{1}{2}$
C. $\frac{1}{2}$
D. $\frac{13}{2}$

DO YOUR FIGURING HERE.

26. What are the solutions to $5x^2 - 30x + 35 = 0$?

- A. $x = -3 \pm \sqrt{2}$
- B. $x = 3 \pm \sqrt{2}$
- C. $x = 6 \pm \frac{\sqrt{34}}{2}$
- D. $x = 6 \pm \sqrt{7}$

27. The width of a rectangle is 3 inches shorter than the length. If the area is 54 square inches, what is the width, in inches?

- A. 3
- B. 6
- C. 9
- D. 18

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.

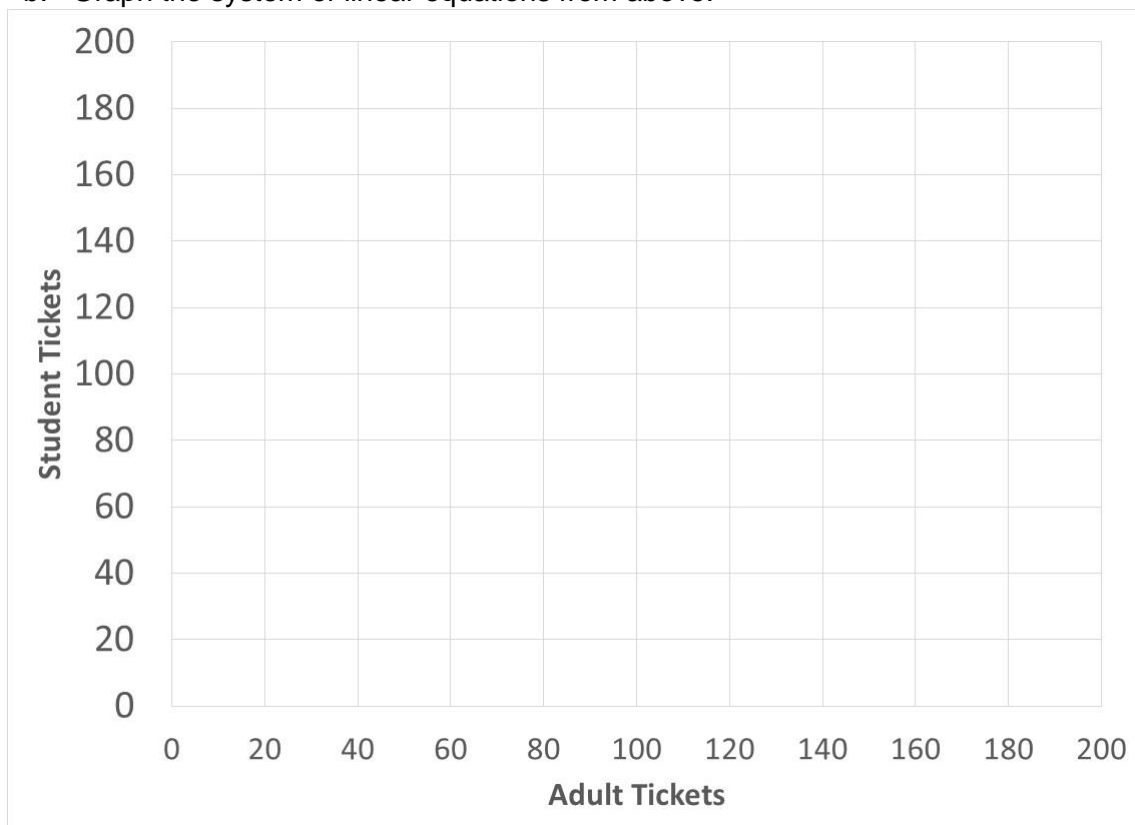
You are allowed to use a calculator for this section of the test. You may use a calculator for any problems you choose, but some of the problems may best be done without using a calculator.

1. PROMPT:

Tickets for a school play cost \$4 for adults and \$2 for students. At the end of the play, the school sold a total of 100 tickets and collected \$360.

- a. Write a system of linear equations using x to represent the number of adult tickets and y to represent the number of student tickets.

- b. Graph the system of linear equations from above.



DO YOUR FIGURING HERE.

- c. Solve the system algebraically for x and y . Show all work.

$x =$	$y =$
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- d. How much money was made from adult tickets?
How much money was made from student tickets?

Adult tickets = \$
Student tickets = \$

DO YOUR FIGURING HERE.

2. PROMPT:

A rocket is launched into the air with an upward velocity of 128 ft/sec. Its height h , in feet, after t seconds is given by the function $h(t) = -16t^2 + 128t$.

- a. Find the vertex of the given function as an ordered pair. Show all work.

(Note: vertex formula for a parabola $x = -\frac{b}{2a}$)

Vertex =

- b. What is the maximum height of the rocket in feet?

Height = _____ feet

- c. How many seconds does the rocket stay in the air? Show all work.

_____ seconds