

**ALGEBRA I
FINAL EXAM
For
SECONDARY SCHOOL CREDIT
2008 – 2009**

DIOCESE OF RICHMOND

School Name: _____ **Student Number:** _____

May 21, 2009

Do not write in this box, for grading purposes only.

Points: _____

Recommended for Credit:

YES

NO

School Name:

Student #:

1. Simplify: $[9(7 - 5) + 8 \times 2^2] \div 2 + 8$

2. Evaluate: $-4b - |a| + |3 + b|$ if $a = -2$
and $b = -5$

3. Solve: $\frac{3x + 7}{2} = 8$

4. Solve: $-8(4 + 9x) = 7(-2 - 11x)$

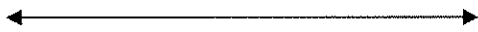
5. Solve: $4(2x - 3) + 8 = -2(2 - 3x) + 2x$

School Name:

Student #:

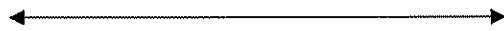
6. Solve and graph the solution set:

$$13 - 2a \leq 15$$



7. Solve and graph the solution set:

$$-4 + 3x > 8 \text{ or } 3x - 1 \leq 8$$



8. The length of a rectangle is 5 less than twice the width. The perimeter of the rectangle is 80 cm. Find the dimensions of the rectangle.

9. Solve and graph the solution set:

$$|2x - 1| < 5$$



10. Carlos is seven years older than Jim. In three years, Carlos will be twice as old as Jim will be then. How old are they now?

School Name:

Student #:

11. Sarah invested \$10,000, part at 5% and the remainder at 7%. The total annual interest she received was \$640. How much did she invest at each rate?

13. Simplify: $\left(\frac{2xy^{-2}z^4}{3xyz^{-1}}\right)^{-2}$

14. Given the following function, complete the table of values.

$$f(x) = -3x + 7$$

x	-5		8
$f(x)$		13	

12. Simplify:

$$(5x^3 - 2x + x^2 + 7) - (3x^2 + 7 - 4x)$$

15. Simplify. Express your answer in scientific notation.

$$(1.32 \times 10^{-6}) \times (2.4 \times 10^2)$$

School Name:

Student #:

16. Simplify:
$$\frac{9z^4 - 6z^3 + 12z^2 - 15z}{-3z}$$

17. Simplify: $(5r - 7)(4r + 3)$

18. Simplify: $(x + 2)(2x + 3)^2$

19. Factor completely:

$$15ay + 40a + 6ny + 16n$$

20. Factor completely:

$$5y^2 + 13y + 6$$

21. Factor completely:

$$9x^2 + 33x - 12$$

School Name:

Student #:

22. Factor completely:

$$49 - 4a^2$$

23. Factor completely:

$$16x^2 - 72xy + 81y^2$$

24. Simplify: $\frac{x^2 - 100}{2x + 20}$

25. Solve: $5a^2 = 2a$

26. Solve: $3x^2 + 5x - 1 = 0$

School Name:

Student #:

27. Two trains leave New York at the same time, one traveling north and the other traveling south. The northbound train travels at 40 mph, while the southbound travels at 30 mph. In how many hours will the trains be 245 miles apart?

28. Simplify: $\frac{9x}{4} + \frac{7x+1}{5} - \frac{6x-5}{2}$

29. Simplify:

$$\frac{x^2 - 8x + 15}{x^3 - 9x} \div \frac{12x - 36}{3x^2 - 27}$$

30. Solve: $\frac{-2}{a-7} = \frac{a}{5}$

School Name:

Student #:

31. Solve: $\frac{1}{m-3} + \frac{1}{m+5} = \frac{m+1}{m-3}$

32. Simplify: $4\sqrt{80} - 3\sqrt{125} - \sqrt{45}$

33. Simplify:

$$(-3\sqrt{4x^6})(-\sqrt{5x^3})(-2\sqrt{8x^2})$$

34. Solve: $x = \sqrt{7x+8}$

35. Jake wants to wash a window that is 15 ft. from the ground. Because there is a garden under the window, he needs to put the foot of the ladder 8 ft. from the base of the house. How long will the ladder need to be so that it can reach the bottom ledge of the window?

School Name:

Student #:

36. Given the points $(0,7)$ and $(6,3)$:

A) Find the midpoint.

B) Find the distance.

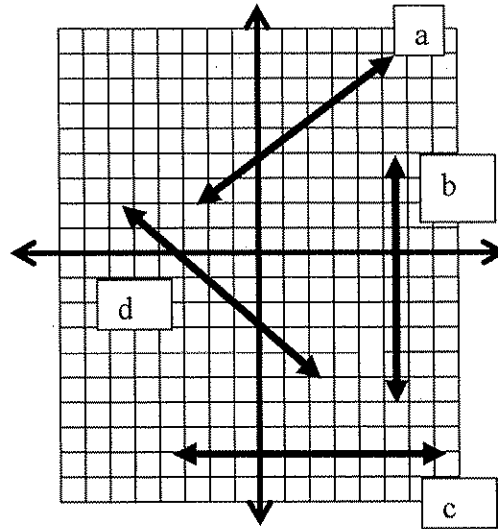
C) Find the slope of the line passing through the points.

37. Find the x - and y - intercepts of the line $2x + y = 4$.

x - intercept =

y - intercept =

38. Write the letter of the line that has the given slope:



Slope undefined =

Zero slope =

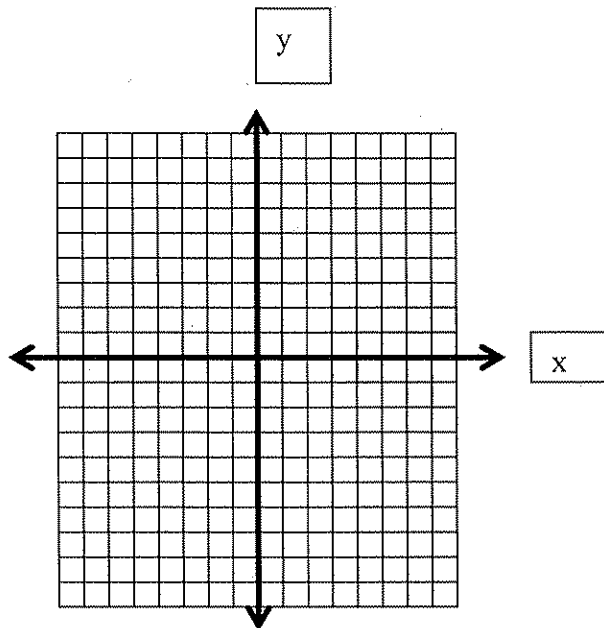
Positive slope =

School Name:

Student #:

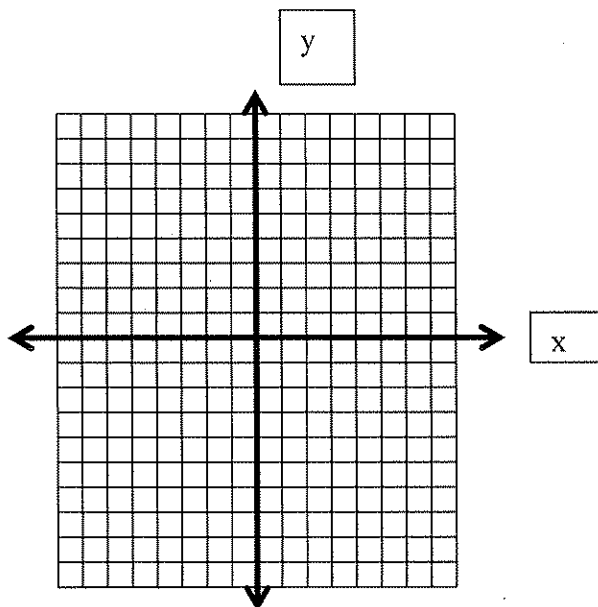
39. Graph the following equation:

$$2x = 3y - 6$$



40. Graph the following inequality:

$$y < \frac{-3}{2}x - 5$$



School Name:

Student #:

41. Write an equation of a line that passes through the point $(3,0)$ and is parallel to the graph of $3x + 9y = 1$

42. Determine an equation of a line that passes through the point $(5,-3)$ and has a slope of -2 . **Final answer must be in slope-intercept form.**

43. Solve the system of equations using any method except graphing.

$$\begin{cases} 3y + 4x = 5 \\ x - 1 = -y \end{cases}$$

44. The beach resort is offering two weekend specials. One includes a 2-night stay with 3 meals and costs \$195. The other includes a 3-night stay with 5 meals and costs \$300. What is the cost of each meal?

45. When the square of the larger of two consecutive positive even integers is added to twice the smaller integer the sum is 76. Find the integers.