**Algebra I Final Exam For Secondary Credit**
**Diocese of Richmond**

Successful completion of this exam will enable a student to receive 1.0 credit towards high school graduation. The attached exam consists of 45 questions that would accumulate a total score of 135 points at 3 points per question. A student must receive a score of 94.5 points or above to pass the exam. Partial credit for incorrect solutions may be awarded if sufficient work is provided.

For grading purposes, please do not write your name anywhere on this test. Mark each page with your school name and student number assigned to you by your instructor.

Show all work in the space that has been provided for each problem. No additional paper will be graded.

Textbooks, notes, and formula sheet are strictly prohibited. Blank scrap paper may be used if provided by the school (**scrap paper will not be graded – all work must be on the exam)**. Students may use a calculator. Graphing calculators are not permitted. **Numerical solutions** may be left in rational form and need not be simplified to obtain maximum credit.

You will have a maximum of 3 hours to complete the 45 questions.

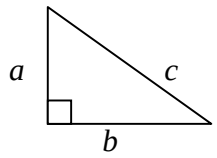
The following may be used during the exam:

$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$m = \dfrac{y_2 - y_1}{x_2 - x_1}$

$a^2 + b^2 = c^2$ for the following triangle:



# ALGEBRA I
# FINAL EXAM
# For
# SECONDARY SCHOOL CREDIT
# 2009 – 2010

## DIOCESE OF RICHMOND

## May 25, 2010

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

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

**Points: _____**

**Recommended for Credit: YES NO**

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1. Simplify: $20-2(-3)^2+12\div 6$

2. Evaluate: $a-\left(\left|c^2+4\right|-\left|a-b\right|\right)$ if $a=-4, b=3, c=-2$

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

4. Solve: $2x-5(x-3)=2(x-10)$

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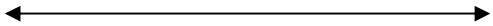
5. Solve: $3(2t-6)=2(3t-9)$

6. Solve and graph the solution set:

$16-5m<-24$

7. Solve and graph the solution set:

$3c+4\geq 13$ or $6c-1<5$



8. Juan is twice as old as Maria. Six years ago, Juan was three times as old as Maria was then. Find the age of each now.

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9. Solve and graph the solution set:

$|3h - 3| < 12$

10. Sam has \$2.05 in quarters and dimes. He hs four more quarters than dimes. How many quarters and dimes does he have?

11. Two sides of a triangle are consecutive odd integers. The third side is twice as long as the shortest side. If the perimeter of the triangle is 22 cm, what is the length of each side?

12. Simplify:

$(20x^2 + 18x - 2x^3 + 18) - (19x^2 + 17 + 12x)$

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13. Simplify: $\left(\frac{5^{-1}xy^{3}z^{-4}}{2x^{2}yz}\right)^{-3}$

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

$$f(x) = 7 - 5x$$

| $x$ | | | -4 |
|---|---|---|---|
| $f(x)$ | -8 | 2 | |

15. Simplify and write your answer in Scientific Notation.

$$(2.01\times10^{3})\bullet(8.2\times10^{-5})$$

16. Simplify:

$$\frac{-96a^{5}+32a^{3}-48a^{2}-60a}{-4a}$$

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17. Simplify: $(6x+5)(2x-1)$

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

19. Factor completely:

$$2ab-6ac+3b-9c$$

20. Factor completely:

$$3p^2+7p-6$$

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21. Factor completely:

$6a^2 - 9a - 15$

22. Factor completely:

$x^3 - 9xy^2$

23. Factor completely:

$m^2 + 16mn + 64n^2$

24. Simplify: $\dfrac{2w^2 + w - 6}{2w + 4}$

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25. Solve: $4s - 4s^2 = 1$

26. Solve: $2x^2 - 3x - 4 = 0$

27. Two planes started at Chicago's O'Hare International Airport and flew in opposite directions. One plane flew 60 mph faster than the other. In five hours, they were 5300 miles apart. Find the rate of each plane.

28. Simplify:

$$\frac{3b-11}{14} + \frac{2b}{7} - \frac{b-6}{2}$$

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29. Simplify:

$$\frac{-7k+42}{k^2-36} \div \frac{k^2-4k-21}{4k^4+12k^3}$$

30. Solve: $\frac{n}{8} = \frac{3}{n+5}$

31. Solve:

$$\frac{r+1}{r-1} = \frac{r}{3} + \frac{2}{r-1}$$

32. Simplify:

$$\sqrt{99} - 3\sqrt{50} + 6\sqrt{44} - \sqrt{2}$$

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33. Simplify:

$$2\sqrt{2x}\left(3\sqrt{4x^3}-2\sqrt{20x^6}+\sqrt{16x^3}\right)$$

34. Solve:

$$\sqrt{35+2x}=x$$

35. A 12 foot wire stretches from the top of a pole to a stake in the ground which is 4 feet from the base of the pole. How tall is the pole?

36. Given the points (3 , -5) and (5 , 3):

A) Find the midpoint.

B) Find the distance.

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

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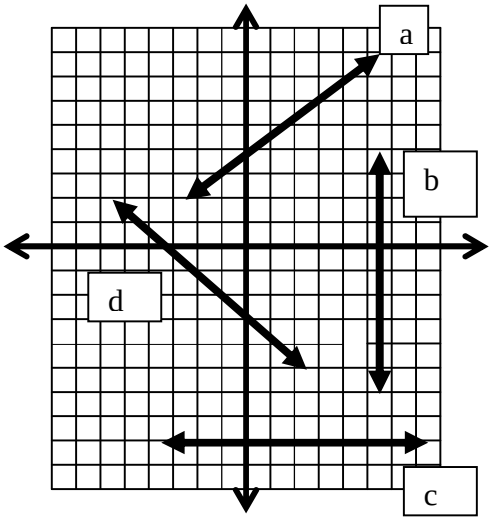
37. Find the x- and y- intercepts of the line

$2x + 3y = 12$

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



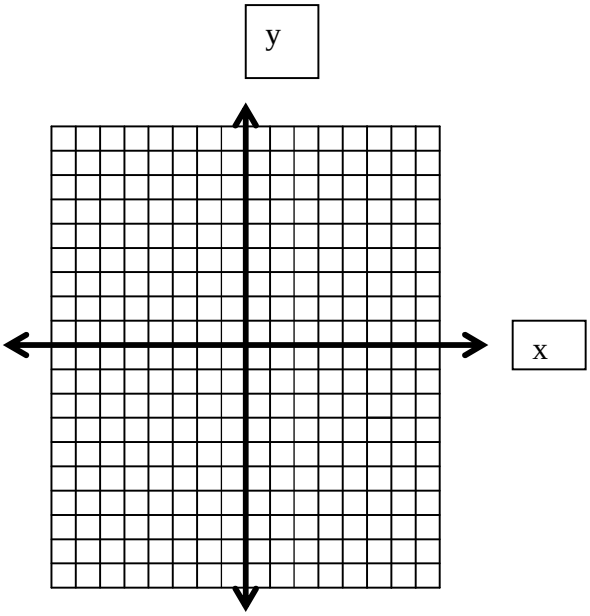

Zero slope =

Negative slope =

Slope undefined =

39. Graph the following equation:

$4x = 3y - 9$



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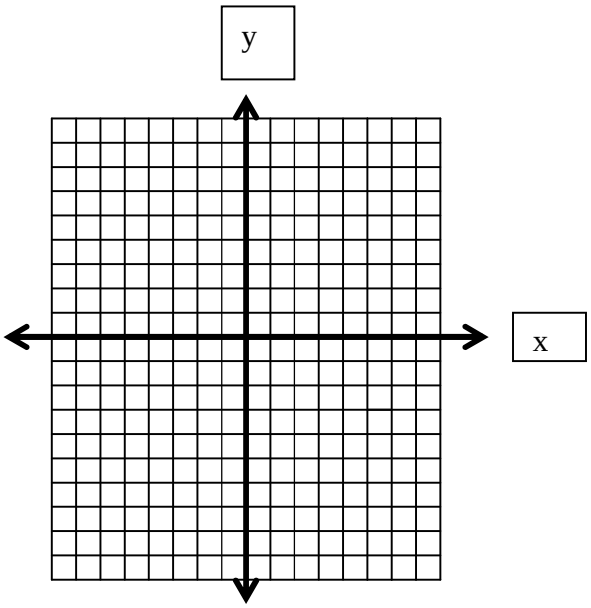
40. Graph the following inequality:

$$y \geq \frac{1}{2}x - 3$$




41. Write an equation of a line that passes through the point (1 , 3) and is parallel to the graph of $2x + y = -4$.

42. Determine an equation of a line that passes through point (-2, 1) and has a slope of –3. **Final answer must be in slope-intercept form.**

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

$$\begin{cases} 5x + y = 12 \\ 2x = 3y - 19 \end{cases}$$

44. A customer bought three cans of carrots and five cans of peas for $9.10. The next customer bought two cans of carrots and three cans of peas and paid $5.55. Both customers planned to donate their canned goods to the local food pantry. Find the cost of one can of each vegetable.

45. Find the value of a positive integer such that five times the square of the integer decreased by twice the integer is 16.