

ALGEBRA COMPETENCY EXAM
Spring 2013

Part I: Free Response, No Calculators, 15 minutes

Name (please print): _____ Date: _____

Please clearly show each step of your work in the space provided. You will be graded mainly on your methods. All questions are worth 2 points each. Simplify all answers as much as possible.

1) Divide: $\frac{12}{35} \div \frac{6}{5}$

1) _____

2) Subtract: $\frac{2}{7} - \frac{5}{4}$

2) _____

3) Simplify: $4 + (7+3)^2 \div 5 \times 5 - 4$

3) _____

4) Simplify: $-8^2 - (3-5)^3$

4) _____

5) Simplify: $\sqrt{48}$

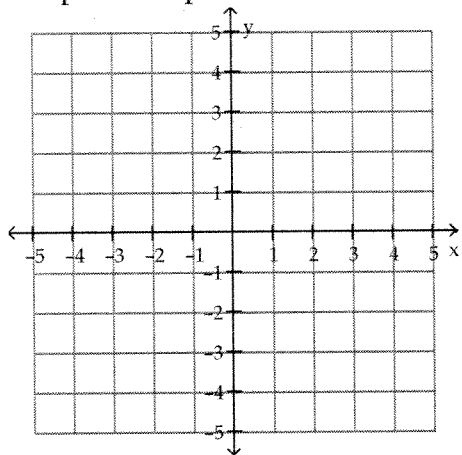
5) _____

6) Multiply: $.24 \times 6.3$

6) _____

7) Graph the equation: $x = -3$

7) _____



8) What is GCF between 54 and 90?

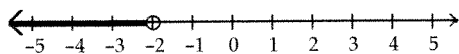
8) _____

9) Rewrite $.28$ as a simplified fraction.

9) _____

10) Write the inequality of the following graph.

10) _____



Part II : Free Response, No Calculators, 65 minutes

Name (please print): _____ Date: _____

Each question is worth 4 points. You will be graded primarily on process, so make sure to clearly show your work.

1) Evaluate the expression $-4x^2 - \frac{2}{x} + 6x$, when $x = \frac{1}{2}$ 1) _____

2) Simplify: $x(x + 3) - 2(x^2 - 2x)$ 2) _____

3) Factor and Simplify: $\frac{x^2 + x - 12}{x^2 + 6x + 8}$ 3) _____

4) Solve the proportion: $\frac{3 + x}{8} = \frac{3x + 2}{16}$ 4) _____

5) Solve for x: $3\sqrt{2x + 8} = 18$

5) _____

6) Mandy bought 7 apples and 5 pears for \$29.00, while Sam bought 9 apples and 4 pears for \$30.00. How much does an apple and a pear cost? Write the equations and solve. (Guessing correctly will only get 1 pt)

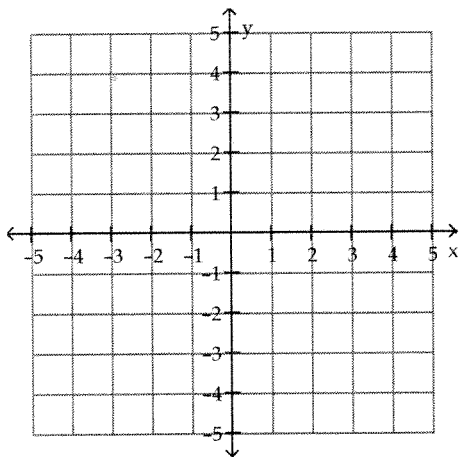
6) _____

7) The product of 4 and the difference of a number and 5 is equal to that number plus 1. Write an equation and find the number.

7) _____

8) Graph the equation: $(y - 4) = -\frac{2}{5}(x+3)$

8)



9) Write an equation in slope-intercept form, $y = mx + b$, of the line that passes through the points (12, -2) and (2, 6).

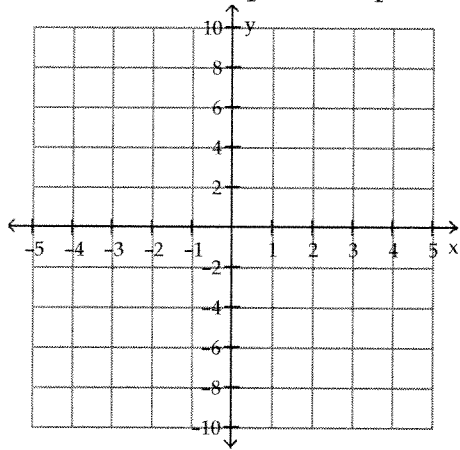
9) _____

10) Simplify: $\frac{-3x^4y^{-2}z^3}{15x^{-8}y^{-4}z^{12}}$ There should not be negative exponents in your answer.

10) _____

11) Graph the equation $y = x^2 + 2x - 8$. Clearly indicate the vertex and the y-intercept of the graph. Be sure to graph enough points to show the complete shape of the graph.

11) _____



12) Solve by factoring or the quadratic formula: $x^2 - 6x - 72 = 0$

12) _____

13) Solve for x: $|3x - 8| = 15$

13) _____

14) Five eighth graders were running the mile as a team. The times of the first four were 6:32, 5:43, 5:48, and 6:22. How fast does the fifth student need to run in order to average a team time of 6 minutes?

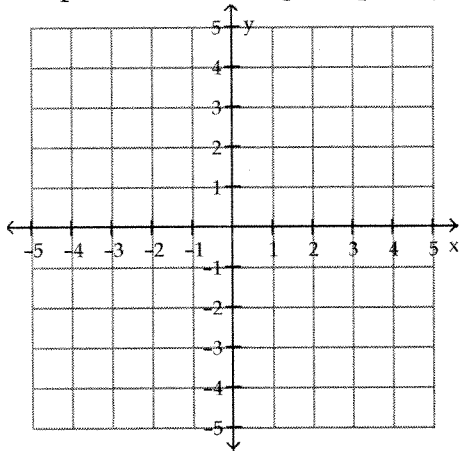
14) _____

15) Solve for x: $4x^2 - 144 = 0$

15) _____

16) Graph the following inequality: $4x - 3y > 12$

16) _____



17) Expand and simplify: $(8x + 3)(5 - 4x)$

17) _____

18) Rewrite the following equation in terms of R:

$$A = \frac{1}{3}(R - 32) + 5$$

18) _____

19) Solve: $\frac{5x}{2} - \frac{2x}{3} = 11$

19) _____

20) The sum of the angles in a triangle is 180 degrees. The second angle is twice the first angle, and the third angle is six times the first angle. Find the measure of each angle.

20) _____

