MATH 026 FORM B

Name_____

Student Number (RUID)_____

Signature_____

Section_____

Professor_____

MATH 026
Final Exam
Fall, 2013

Exam Score_____

Course Grade_____

This exam contains 25 questions. Make sure that your copy of the exam contains all of them. Each problem is worth 4 points.

Show **ALL** work. Unsupported answers may not receive full credit. Word problems must be solved algebraically.

You may use a scientific calculator. Graphing calculators are **NOT** permitted on this exam.

MATH 026 FORM B

1) Factor each of the following completely:

a) $15x^2 - 4x - 3$

1a)_____

b) $x^3 - 3x^2 - x + 3$

1b)_____

2) Divide $(x^3 + 6x - 8) \div (x + 2)$ by using long division.

2) _____

3) Solve and graph the solution set for x: $|7x + 3| < 10$.

4) Evaluate each of the following given: $x = 49, y = -8, z = 2$.

$z^{-1}\, x^{\frac{1}{2}} y^{\frac{2}{3}}$

4) _____

5) Let $g(x) = x^2 - 7$ and $f(x) = 4x$. Find each of the following:

a) $g(-3)$

5a)_____

b) $g(x) + 1$

5b)_____

c) $f(x - 2)$

5c)_____

d) $g(x) + f(x)$

5d) _____

6) Find the equation of the line satisfying each of the following conditions.

a) The line is perpendicular to the x-axis and passes through the point $(-2,5)$.

6a) _____

b) The line passes through the points $(7,3)$ and $(-1,6)$. Express your answer in slope-intercept form.

6b) _____

7) Use the points $A(-10,4)$ and $B\ (2,-6)$ to find each of the following.

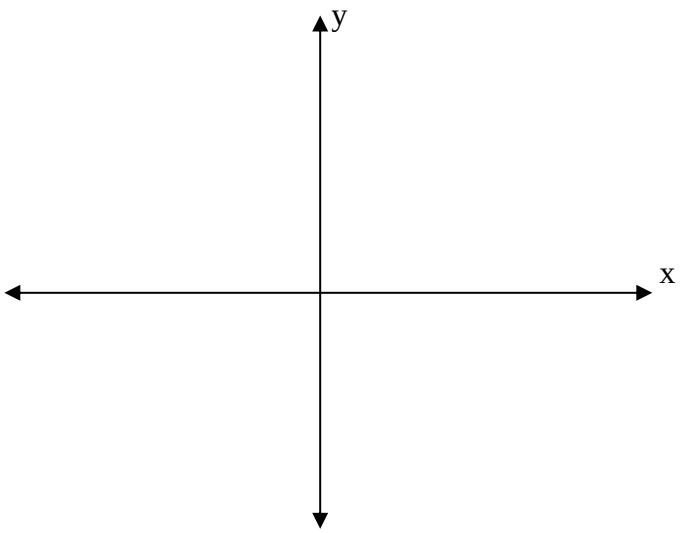
a) The length of line segment AB in simplest radical form.

7a) _____

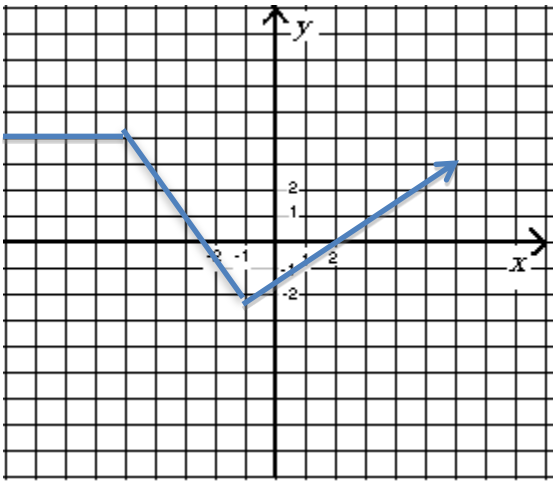
b) The midpoint of line segment AB.

7b) _____

8) Sketch the solution set to the inequality $2x - 7y < 28$. **Label the x and y intercepts on your graph**.



9) Use the graph of the function *f(x)* defined below to answer the following questions.



a) $f(-2)$ 9a) _____

b) For ***how many*** value(s) of x is $f(x) = 0$? 9b) _____

c) $f(2) + f(-7)$ 9c) _____

d) $f(0) > f(-7)$ True or False 9d) _____

10) Solve the following system of equations algebraically.

$$\begin{cases} 3x + 4y = \frac{4}{3} \\ 5x + 6y = 1 \end{cases}$$

x =_____

y =_____

11) Perform the indicated operation. Express the answer as a fraction in lowest terms.

$$\frac{x-2y}{4x^2+8xy} \div \frac{x^2-xy-2y^2}{2x^2+4xy}$$

11) _____

12) Simplify the expression and reduce to lowest terms if possible.

$$\frac{2}{x^2-5x+6}-\frac{4}{x^2-x-2}$$

12) _____

13) Express as a simple fraction reduced to lowest terms.

$$\frac{1-\frac{9}{x^2}}{1-\frac{3}{x}}$$

13) _____

14) Solve $x^2 - 4x + 12 = 0$ for x. Express your answer in simplest complex form.

14) _____

15) Upon receiving a $1200 inheritance, Jensen made two investments. He invested part of his money in a CD paying 5.5% yearly interest, and the rest in a bond paying 6.25% yearly interest. His total yearly interest from the two investments was $69. How much did he invest in the CD? (**Only algebraic solutions will be accepted**.)

15) _____

16) Solve for a :

$$\frac{5}{2a} + \frac{2}{a+1} = \frac{6}{a^2+a}$$

16) _____

17) Simplify each of the following.

a) $\sqrt[3]{128x^9y^8}$

17a) _____

b) $\left(\sqrt{x}+\sqrt{-9}\right)\left(\sqrt{x}-\sqrt{-9}\right)$

17b) _____

18) For each of the following rationalize the denominator and simplify.

a) $\frac{7}{3-\sqrt{2}}$

18a) _____

b) $\sqrt[4]{\frac{3}{3x^3}}$

18b) _____

19) How long would it take a car traveling at 50 mph to overtake a car traveling at 45 mph with a 1 hour head start? (**Only algebraic solutions will be accepted.)**

19) _____

20) Solve explicitly for x: $y = \frac{3x}{x-2}$

20) $x =$_____

21) Determine the center and radius of the circle $x^2 + y^2 + 4y - 7 = 0$.

Center:_____ Radius: _____

22) The profit made on a 4 minute roller coaster ride is related to the price (x) of the ticket in the following way:

$$P(x) = -200x^2 + 1200x$$

What ticket price would produce the maximum profit?

22) _____

23) Solve $x^2 - 6x - 16 < 0$. **Provide an analysis of your solution**. Then write your solution using **interval notation**.

Solution: _____

24) Solve each of the following for x.

$$\sqrt{2x - 3} + 3 = x$$

24) x =_____

25) After having returned a set of research papers a professor asked his students how many hours they spent researching their individual assignments. Based on their responses, he later noted that a linear relationship existed between the number of hours, ***x***, a student spent on doing research for their paper and the grade, G, received on the paper. Those students who put in 2 hours of research time scored 50 points, while those who put in 30 hours scored 90 points.

Write an equation relating G to ***x*** where **G is expressed as a function of *x*.**
(**Only algebraic solutions will be accepted.)**

25) $G(x) =$ _____