Autumn 2013 Name (Print): _____

Form A Signature: _____

OSU name.#: _____

Lecturer: _____

Recitation Instructor: _____

Recitation Time: _____

Math 1075: Final Exam

Instructions:

- Show ALL work to receive full credit. Answers with insufficient supporting work will receive little or no credit.
- Please CIRCLE your answers

Page	1	2	3	4	5	6	7	8	9	10	Total
Maximum Points	20	24	18	20	18	14	24	24	18	20	200
Student Score											

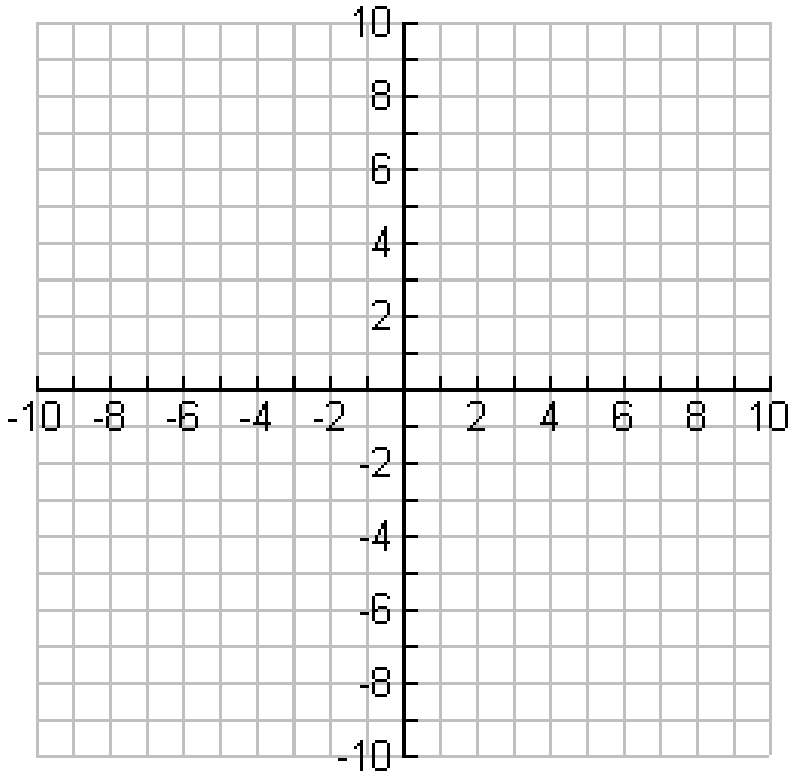
1. Solve the following inequalities ***algebraically***. *Express your answer in interval notation.*

(10 points each)

a) $-5 \le 3x + 1 < 13$

b) $\left| 6y + 5 \right| \ge 47$

2. Graph the solution set of $\begin{cases} 2x-5y>10 \\ 2x-y\le 7 \end{cases}$ on the grid below. (8 points)



3. a) Write the sentence as a mathematical inequality. (6 points)

Three more than the product of four and m never exceeds five times m.

b) Algebraically solve your answer to part a). (4 points)
Express your answer in interval notation.

4. Completely factor each of the following. (8 points each)

a. $15ax^2 - 10ax - 21bx + 14b$

b. $81c^2 - 64d^2$

c. $3w^2 + 11w - 20$

5. Solve the following quadratic equations using the method indicated (8 points each)

a) Using factoring: $c^2 = -8c + 65$

b) Using the quadratic formula: $6x^2 + 8x = 8$

c) Using completing the square: $w^2 - 6w - 16 = 0$

6. Given the points $(6,5)$ and $(-3,-1)$:

a. Find the slope of the line that passes through both points. (5 points)

b. Determine the equation of the line (in $f(x)=mx+b$ form) that passes through both points. (5 points)

c) Determine the equation of the line (in $f(x)=mx+b$ form) parallel to your line from part b) that passes through the point $(0,-4)$. (4 points)

7. The height of a golf ball hit from a platform can be modeled by the function $h(t) = -16t^2 + 91t + 30$, where *h* is the height of the ball (in feet) *t* seconds after being hit.

a. After how many seconds will the ball hit the ground? (6 points)

b. When does the ball reach its maximum height? (6 points)

c. What is the ball's maximum height? (6 points)

8. Solve the equations below: (10 points each)

a. $\sqrt{16v-15}=2v$

b. $\dfrac{2r}{r-3}-\dfrac{3r}{r-4}=\dfrac{-6}{r^2-7r+12}$

9. The force required to prevent a car from skidding on a curve varies inversely as the radius of that curve. A force of 7500 lbs. is needed to prevent a car from skidding on a curve of radius 800 feet.

a. What is the constant of variation? (6 points)

b. Write an equation relating the force needed to prevent a car from skidding to the radius of the curve. (6 points)

c. What force is necessary to prevent a car from skidding on a curve of radius 250 feet? (6 points)

10. Simplify each of the following expressions. (8 points each)

a. $\dfrac{-20}{\sqrt{6}+1}$

b. $(8-i)(5+6i)$

c. $\left(\dfrac{12a}{a+b} \div \dfrac{5a-5}{a^2-b^2}\right)\left(\dfrac{3ab}{ab-b}\right)$

Problems 11 – 15 are multiple choice. **Circle the correct answer; *only one answer is correct.***

(5 points each)

11. The set $[-5,7)\cap(-2,11]$ is equivalent to:

a. $[-5,11]$ b. $(7,11]$ c. $[-5,-2)$ d. $(7,-2)$

12. i^{45} is equal to

a. i b. -1 c. $-i$ d. 1

13. The domain of the rational function $R(x)=\dfrac{13x-5}{x^2-10x+24}$ in interval notation is:

a. $(-\infty,-2)\cup(12,\infty)$ b. $(-\infty,-6)\cup(-6,-4)\cup(-4,\infty)$

c. $(-\infty,-2)\cup(-2,12)\cup(12,\infty)$ d. $(-\infty,-6)\cup(-4,\infty)$

14. Evaluate $-16^{-1/4}$

a. $-\dfrac{1}{2}$ b. undefined c. $\dfrac{1}{2}$ d. 4

15. Which of the following relations represents a function?

a. $\{(-4,0),(0,-40),(0,40),(4,0)\}$ b. $\{(-8,-11),(-8,11),(11,-8),(-11,8)\}$

c. $\{(-6,-3),(-3,26),(26,-6),(6,26)\}$ d. $\{(-5,-2),(-2,12),(12,-2),(-2,5)\}$