Math 105: Intermediate Algebra
Sample Final Exam

What are the rules of this exam?

1. PLEASE DO NOT TURN THIS PAGE UNTIL TOLD TO DO SO!

2. Bags must be in the front of the room.

3. Please turn off your cell phones during this exam. No cell phones will be allowed on your desk.

What can I use on this exam?

1. You may use FOUR note card that is no larger then 8.5 inches by 11 inches. You may write on both sides of this note card. PLEASE SUBMIT YOUR NOTECARD WITH YOUR EXAM.

2. You are allowed to use calculators for this exam. Examples of acceptable calculators include TI 83, TI 84, and TI 86 calculators. You are not allowed to use any calculator with a Computer Algebra System including TI 89 and TI NSpire. If you have a question, please ask your instructor about this.

How will I be graded on the Free-Response Questions?

1. Read the directions carefully. Show all your work for full credit. In most cases, a correct answer with no supporting work will NOT receive full credit. What you write down and how you write it are the most important means of getting a good score on this exam. Neatness and organization are IMPORTANT!

2. You will be graded on proper use of formulas and definitions from in-class discussions and homework.

Part 1: Simplify Algebraic Expressions

(6 problems, 5 points each) Simplify each of the following expression. Show your work. You can earn partial credit if you are able to make some progress and if your work is easy to read.

1. Please simplify by multiplying and combining like terms: $(1 - r) \cdot (1 + r + r^2)$

2. Please simplify by factoring completely: $4x^3 + 19x^2 - 5x$

3. Divide and simplify the rational expressions: $\dfrac{3z + 18}{z - 2} \div \dfrac{z^2 + 2z - 24}{z - 2}.$

4. Add and simplify the rational expressions: $\dfrac{w}{7 + w} + \dfrac{9w - 35}{w^2 - 49}$

$\dfrac{3z + 18}{z - 2} \div \dfrac{z^2 + 2z - 24}{z - 2}.$

5. Simplify the following radical expression: $\sqrt[3]{\left(w^6 \cdot y^{10}\right)}$

6. Simplify the radical expression: $\dfrac{\sqrt{98a^2b^9}}{3\sqrt{2a^6b^7}}$

Part 2: Use Algebraic Techniques to Solve Algebraic Equations

(8 problems points: 5 points each) Solve each of the following equations for x using the appropriate algebraic technique. Show your work. You can earn partial credit if you are able to make some progress and if your work is easy to read.

1. $2x - 2 = -5 - x$

2. $x^2 - 6x = -5$

3. $2x^2 = 7x - 5$.

4. $$3 \cdot \left|x + 2\right| - 4 = 5$$

5. $$3 - \frac{5}{x} - \frac{2}{x^2} = 0$$

6. $$\frac{x^2 - 5x + 4}{x^2 - 16} = \frac{x - 4}{x}$$

7. $\qquad \sqrt{3x} + 1 = 6$
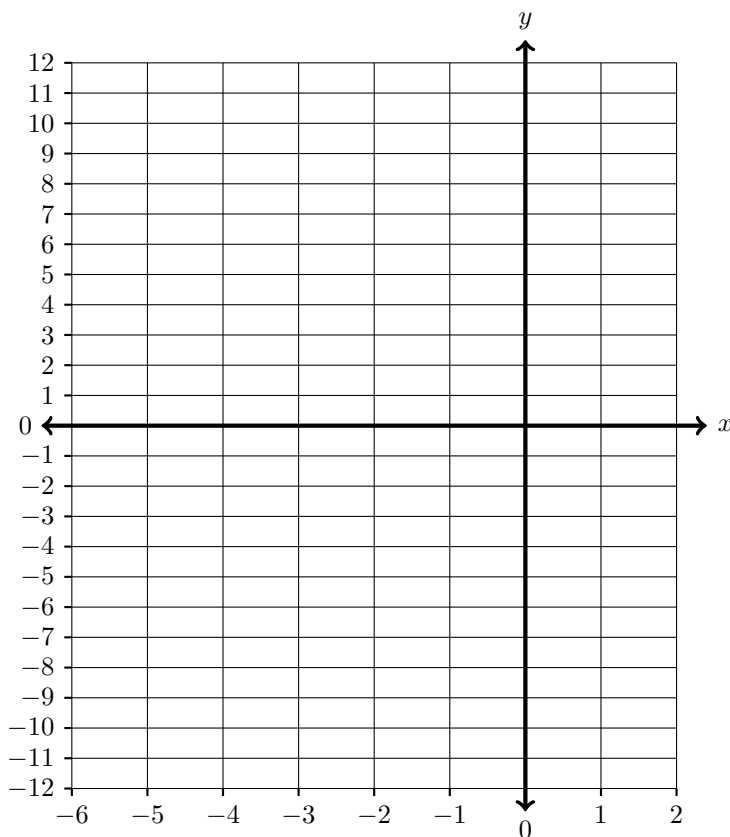
8. $\qquad 2(x-4)^3 = -16$

Part 3: Use an Graphical Technique to Solve Algebraic Equations

(3 problems points: 10 points each) Solve each of the following equations for x using a graphical technique. Show your work. You can earn partial credit if you are able to make some progress and if your work is easy to read.

10   1. Using a calculator, solve the absolute value equation below using a graphical technique. Make sure to demonstrate all five steps of this process. Please specifically identify each point of intersection on your graph and write each of these points as an ordered pair. Make sure to finish step 5 and use this information to explicitly state the solution(s) to this algebraic equation:

$$3 \cdot \left| x + 2 \right| - 4 = 5$$

x	LHS of Equation	RHS of Equation
-6		
-5		
-4		
-3		
-2		
-1		
0		
1		
2		

1. Using a calculator, solve the absolute value equation below using a graphical technique. Make sure to demonstrate all five steps of this process. Please specifically identify each point of intersection on your graph and write each of these points as an ordered pair. Make sure to finish step 5 and use this information to explicitly state the solution(s) to this algebraic equation:
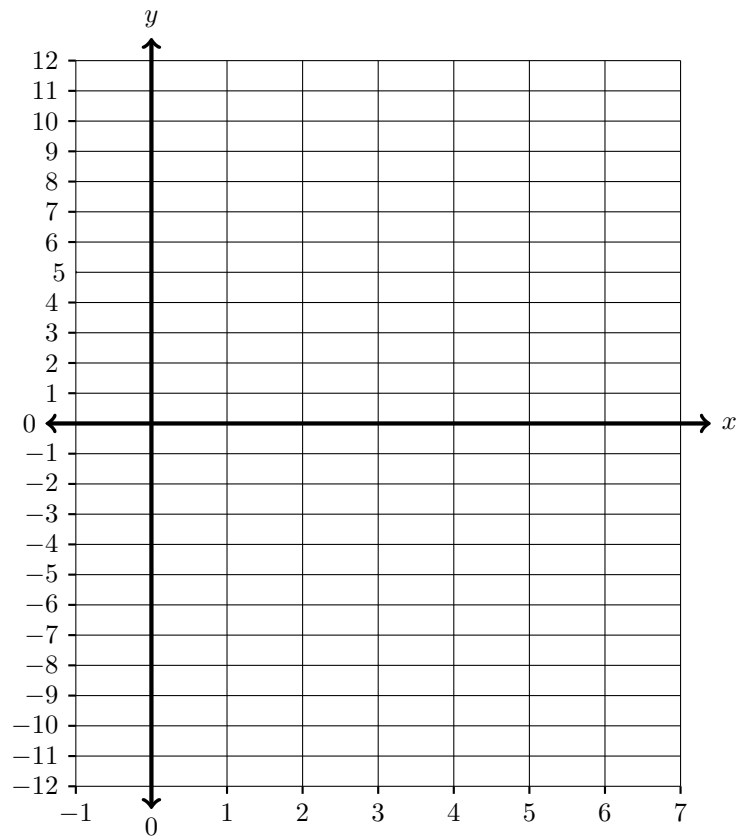
$$x^2 - 6x = -5$$

	LHS of Equation	RHS of Equation
x		
-1		
0		
1		
2		
3		
4		
5		
6		
7		

1. Using a calculator, solve the absolute value equation below using a graphical technique. Make sure to demonstrate all five steps of this process. Please specifically identify each point of intersection on your graph and write each of these points as an ordered pair. Make sure to finish step 5 and use this information to explicitly state the solution(s) to this algebraic equation:

$$2x - 2 = -5 - x$$

	LHS of Equation	RHS of Equation
x		
-4		
-3		
-2		
-1		
0		
1		
2		
3		
4		