Final Exam Review

Name _____

Math 090/095

Free Response Problems - Show all work. Supply explanations when necessary. You should not use your scantron sheet for the free response problems.

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1. (Math 090/095) For this problem, consider the equation $x(x-1) = x + 15$.

   (a) What is the name of this type of equation?

   (b) In several sentences describe how you would solve this equation. Give enough detail so that a friend could use your plan to solve the equation.

   (c) Use the plan you described above to solve the equation.

   (d) Choose any one of your solutions and check that it is indeed a solution.

   (e) Does the plan you described above still work if the equation is changed to the following?

   $$x(x-1) = x + 14$$

2. (Math 090/095) For this problem, consider the equation $2(x-3) = 7x + 9$.

   (a) What is the name of this type of equation?

   (b) In several sentences describe how you would solve this equation. Give enough detail so that a friend could use your plan to solve the equation.

   (c) Use the plan you described above to solve the equation.

   (d) Choose any one of your solutions and check that it is indeed a solution.

   (e) Does the plan you described above still work if the equation is changed to the following?

$$2(x-3) = 7x^2 + 9$$

3. (Math 095) For this problem, consider the equation $\left|\frac{x+2}{2}\right| - 6 = 4$.

(a) What is the name of this type of equation?

(b) In several sentences describe how you would solve this equation. Give enough detail so that a friend could use your plan to solve the equation.

(c) Use the plan you described above to solve the equation.

(d) Choose any one of your solutions and check that it is indeed a solution.

(e) Does the plan you described above still work if the equation is changed to the following?

$$\left|\frac{x+2}{2}\right| + 6 = 4$$

4. (Math 095) For this problem, consider the equation $\sqrt{5x+15}+2=7$.

   (a) What is the name of this type of equation?

   (b) In several sentences describe how you would solve this equation. Give enough detail so that a friend could use your plan to solve the equation.

   (c) Use the plan you described above to solve the equation.

   (d) Choose any one of your solutions and check that it is indeed a solution.

   (e) Does the plan you described above still work if the equation is changed to the following?

$$\sqrt{5x+15}+2=-7$$

5. Name the type of equation, briefly describe a solution method, solve, and check.

(a) (Math 090/095) $3 + 2(x - 7) + 3x = 2x + (x - 5) - 2$

(b) (Math 090/095) $3x^2 - 9x + 7 = 2x^2 - 2x + 1$

(c) (Math 095) $-3|2x + 5| + 8 = 3$

(d) (Math 090) $\dfrac{5 - x}{7} = \dfrac{1}{x + 3}$

(e) (Math 095) $\sqrt{2(x + 3)} - 10 = 2$

6. (Math 090) Some rational equations can be solved by cross multiplying. Does this strategy always work?

7. (Math 095) What kinds of absolute value equations have no solutions?

8. (Math 090) Fred claims that $x = 3$ is a solution of $\frac{x}{x+2} - \frac{3}{x-3} = 0$. Without actually solving Fred's equation, explain why he must be wrong.

9. (Math 095) Marie claims that $x = 1$ is a solution of $\sqrt{2x+5} = -3$. Without actually solving Marie's equation, explain why she must be wrong.

10. (Math 090/095) What does it mean for a number to be a solution of an equation? (Answer in a complete sentence.)

11. (Math 090/095) What does it mean to solve an equation? (Answer in a complete sentence.)

12. For each equation shown below, only one of the two given numbers is a solution. Without actually solving the equation, determine which one of the two numbers is a solution.

(a) (Math 090/095) $12 - 6x + 3(2x + 3) = 2x + 5$; $x = -2$ or $x = 8$

(b) (Math 090/095) $3x^2 = -21x - 18$; $x = -1$ or $x = 6$

(c) (Math 090) $\dfrac{9}{x+1} = \dfrac{5}{x-3}$; $x = 3$ or $x = 8$

(d) (Math 090/095) $x + \dfrac{12}{x} = -7$; $x = 3$ or $x = -4$

(e) (Math 095) $|2x - 4| + 5 = 13$; $x = -2$ or $x = -6$

(f) (Math 095) $\sqrt{2x - 3} = x - 3$; $x = 2$ or $x = 6$