College Algebra
Fall 2021
Exam Three
11/10/22
Time Limit: 80 Minutes

Your Name: _____

Instructor: _____

This exam contains 5 pages (including this cover page) and 7 problems. Check to see if any pages are missing. Enter all requested information on the top of this page, and put your initials on the top of every page, in case the pages become separated.

You may *not* use your books, notes, or **any calculator** on this exam.

You are required to show your work on each problem on this exam. The following rules apply:

- **Organize your work**, in a reasonably neat and coherent way, in the space provided. Work scattered all over the page without a clear ordering will receive very little credit.
- **Box your final answer** and label the solution with the appropriate variables (if applicable).
- **Simplify your final answer**. A correct answer, written in an unsimplified way, will receive less than full credit. All fractions must be written such that the numerator and denominator share no common factors.
- Do not leave a question blank. You will not be penalized for incorrect work, and partial answers may receive partial credit.

Do not write in the table to the right.

Problem	Points	Score
1	5	
2	10	
3	25	
4	25	
5	5	
6	20	
7	20	
Total:	110	

1. (5 points) Write your name and the name of the instructor on page one.
2. Expand the Following Polynomials and Find the Degree
   (a) (5 points)
   $$(6x^2 - 2x + 1) - (x - 3)(x^2 + 5x + 10)$$
   (b) (5 points)
   $$(2x + 5)(x + 4) + (x + 2)(x + 4)$$
3. Completely Factor the Polynomial:
   (a) (5 points)
   $$x^4 - 16$$
   (b) (5 points)
   $$x^2 + x - 20$$
   (c) (5 points)
   $$2bx + 6by + ax + 3ay$$
   (d) (5 points)
   $$3x^4 - 3x^2$$
   (e) (5 points)
   $$6x^2 - 4x - 16$$

4. Completely Factor and Solve the Polynomial for x

   (a) (5 points)

   $$(5x - 3)(x - 2) = 0$$

   (b) (5 points)

   $$9x^2 - 48x + 64 = 0$$

   (c) (5 points)

   $$3x^2 = 48$$

   (d) (5 points)

   $$x^3 + 16x^2 + 48x = 0$$

   (e) (5 points)

   $$16 + 6x - x^2 = 0$$

5. (5 points) A triangular lot has a height that is 8 yards longer than the base. The area of the lot is 24 square yards. Find the base and height of the lot.

6. **Simplify** and List the Restricted Values for x

(a) (5 points)

$$\frac{5}{x^2-1}+\frac{9}{x^2+2x+1}$$

(b) (5 points)

$$\frac{3x}{x^2-6x}+\frac{4}{x}$$

(c) (5 points)

$$\frac{15x^3-15x^2}{5x^3-5x}$$

(d) (5 points)

$$\frac{\frac{3}{x}-\frac{2}{y}}{\frac{4}{y}-\frac{7}{xy}}$$

7. **Solve** for x

(a) (5 points)

$$\frac{x+5}{2} - \frac{x-3}{6} = \frac{2}{3}$$

(b) (5 points)

$$x - \frac{1}{x} = \frac{17}{4}$$

$$\left[\frac{1}{4},\ 4\right]$$

(c) (5 points)

$$\frac{3x}{3x-6} = \frac{6}{3x-6}$$

(d) (5 points)

$$1 + \frac{1}{x-1} = \frac{1}{x^2-x}$$