

College Algebra

Fall 2022

Exam Four

12/8/22

Time Limit: 80 Minutes

Your Name: \_\_\_\_\_

Instructor: \_\_\_\_\_

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This exam contains 5 pages (including this cover page) and 6 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.

Problem	Points	Score
1	5	
2	30	
3	20	
4	25	
5	15	
6	15	
Total:	110	

Do not write in the table to the right.

1. (5 points) Write your name and the name of the instructor on page one.
2. Express each of the following in simplest radical form

(a) (5 points)

$$\frac{\sqrt{x} - 2}{\sqrt{x} + 6}$$

(b) (5 points)

$$\sqrt{\frac{27}{16}}$$

(c) (10 points)

$$\frac{\sqrt[3]{12xy}}{\sqrt[3]{3x^2y^5}}$$

(d) (5 points)

$$\sqrt[3]{64}$$

(e) (5 points)

$$i^{123}$$

3. Express each of the following complex numbers in standard form

(a) (5 points)

$$(10 + 2i)(-2 - i)$$

(b) (5 points)

$$\sqrt{\frac{-16}{25}}$$

(c) (5 points)

$$\frac{-4 - 7i}{6i}$$

(d) (5 points)

$$\frac{2 + 6i}{1 + 7i}$$

4. Solve each of the following equations

(a) (5 points)

$$x^2 - 7x + 3 = 0$$

(b) (5 points)

$$\sqrt{2x - 1} - \sqrt{x + 3} = 1$$

(c) (5 points)

$$(x + 3)(2x + 1) = -3$$

(d) (5 points)

$$3(x - 7)^2 + 4 = 79$$

(e) (5 points)

$$x^2 + 6x - 3 = 0$$

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5. (15 points) Find the length of one of the legs of an isosceles right triangle whose hypotenuse has a length of 5 meters.
6. (15 points) Graph the function  $f(x) = 2x^2$ . Explicitly write the function that is obtained by shifting  $f(x)$  5 units down and 8 units to the right.