

College Algebra- Exam 1

Fall 2013

Name (Print): _____

Time Limit: 50 Minutes

Teaching Assistant _____

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

- **If you use a “fundamental theorem” you must indicate this** and explain why the theorem may be applied.
- **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.
- **Mysterious or unsupported answers will not receive full credit.** A correct answer, unsupported by calculations, explanation, or algebraic work will receive no credit; an incorrect answer supported by substantially correct calculations and explanations might still receive partial credit.
- If you need more space, use the back of the pages; clearly indicate when you have done this.

Problem	Points	Score
1	15	
2	15	
3	20	
4	25	
5	25	
Total:	100	

Do not write in the table to the right.

1. (15 points) Give the graph of the equation and find the x - and y - intercepts.

(a) (7 points) $y = 16 - 4x^2$.

(b) (8 points) $x^2 + (y - 2)^2 = 0$.

2. (15 points) Solve the equation and check your solution.(If not possible, explain why.)

(a) (7 points) $x^2 - 8x + 5 = (x - 4)^2 - 11$.

(b) (8 points) $\frac{7}{2x+1} - \frac{8x}{2x-1} = -4$.

3. (20 points) Solve the following equations using any convenient method.

(a) (5 points) $x^2 + 4x - 32 = 0$.

(c) (5 points) $3x^2 - 2x + 5 = 0$.

(b) (5 points) $x^2 - 2x - 1 = 0$.

(d) (5 points) $\sqrt{2x + 7} - x = 2$.

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4. (25 points) The floor of a one-story building is 14 feet longer than it is wide. The building has 1632 square feet of the floor space.
- (a) (7 points) Draw a diagram that gives a visual representation of the floor space. Represent the width as w and show the length in terms of w .
- (b) (8 points) Write a quadratic equation in terms of w .
- (c) (10 points) Find the length and with of the floor of the building.

5. (25 points) The number of medical doctors D (in thousands) in the United States from 1994 to 2002 can be modeled by

$$D = 463.97 + 111.6\sqrt{t}, 4 \leq t \leq 12$$

where t represents the year, with $t = 4$ corresponding to 1994.

- (a) (10 points) In which year did the number of medical doctors reach 816000 ?

- (b) (15 points) Use the model to predict when the number of medical doctors will reach 900,000. Is this prediction reasonable? Why?