Name: _____ Section: _____

MA 109 Spring 2014

Exam 1 February 12, 2014

Directions:

- Do not remove this page—you will turn in the entire exam. You have two hours to do this exam. No books or notes may be used. You may use a graphing calculator during the exam, but NO calculator with a Computer Algebra System (CAS) or a QWERTY keyboard is permitted. Absolutely no cell phone use during the exam is allowed.
- The exam consists of multiple choice and short answer questions. Record your answers on this page by filling in the appropriate selection, for example:

  (A) B C D E.

- The exam is out of 100 total points: 5 points for each of 20 questions. **Only** this front page will be graded and **no partial credit** will be awarded. It is recommended that you check your work!

1. (A) B C D E
2. (A) B C D E
3. (A) B C D E
4. (A) B C D E
5. (A) B C D E
6. (A) B C D E
7. (A) B C D E
8. (A) B C D E
9. (A) B C D E
10. (A) B C D E
11. (A) B C D E
12. (A) B C D E
13. (A) B C D E
14. (A) B C D E
15. (A) B C D E
16. _____
17. _____
18. _____
19. _____
20. _____

For grading use:

Total	
	(out of 100 pts)

Name: _____ Section: _____

Multiple Choice: Show your work in the space below and shade the correct answer on the front page for each of the following.

1. Solve the following equation for x.

$$3x^2 - 5x = 1$$

Choices:

(a) $\dfrac{1 \pm \sqrt{13}}{2}$

(b) $\dfrac{5 \pm \sqrt{37}}{6}$

(c) $\dfrac{-5 \pm \sqrt{37}}{6}$

(d) There are no real solutions.

(e) $\dfrac{5 \pm \sqrt{13}}{6}$

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2. Which one of the following points is on the graph of the equation

$$x - x^2y = 5?$$

Choices:

(a) $(0, 5)$

(b) $(1, 4)$

(c) $(-1, -6)$

(d) $(-1, 6)$

(e) $(-2, -1)$

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3. Solve the following equation for s.

$$8(3-s)^2 = 16$$

Choices:

(a) $\pm\sqrt{5}$

(b) $\sqrt{8}$

(c) $\sqrt{2}$

(d) The equation can not be solved for s.

(e) $3 \pm \sqrt{2}$

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4. Solve the following equation for x.

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

Choices:

(a) The equation has no solutions.

(b) $x = 1$ only.

(c) $x = 1$ and $x = 5$.

(d) $x = 5$ only.

(e) $x = -3$ and $x = 2$.

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5. Solve the following equation for x.

$$x^2(x^3+5) = 0$$

Choices:

(a) The equation has no solutions.

(b) $x = 0$ only.

(c) $x = \sqrt[3]{-5}$ only.

(d) $x = 0$ and $x = \sqrt[3]{-5}$

(e) $x = \pm\sqrt[3]{5}$ only.

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6. Find the value of k that makes the following expression a perfect square.

$$x^2 - 6x + k.$$

Choices:

(a) 3

(b) 9

(c) $\frac{3}{2}$

(d) -9

(e) $\frac{-9}{4}$

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7. Solve the following equation for x.

$$|x + 5| = 2$$

Choices:

(a) $x = -3$ and $x = -7$.

(b) $x = -3$ only.

(c) $x = 3$ only.

(d) $x = 7$ only.

(e) $x = -1$ only.

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8. Find the distance between the points $(-2, 1)$ and $(1, -3)$.

Choices:

(a) $\sqrt{5}$

(b) $\sqrt{7}$

(c) 5

(d) ± 5

(e) 25

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9. Find the exact value of

$$|\sqrt{2}-3|.$$

Choices:

(a) $\sqrt{2}+3.$
(b) $3-\sqrt{2}$
(c) 1.5858
(d) $-3+\sqrt{2}$
(e) -1

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10. Find k so that the following equation has only one solution.

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

Choices:

(a) $-\frac{4}{9}$
(b) $\frac{9}{4}$
(c) 9
(d) $\frac{3}{2}$
(e) 0

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11. Find the equation of a circle with center $(5,1)$ such that the point $(5,7)$ is on the circle.

Choices:

(a) $(x+2)^2+(y+7)^2=4$
(b) $(x-5)^2+(y-1)^2=6$
(c) $(x-2)^2+(y-7)^2=4$
(d) $(x+5)^2+(y+1)^2=49$
(e) $(x-5)^2+(y-1)^2=36$

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12. How many distinct real solutions does the equation $x^3 - x^2 + 4x - 4 = 0$ have?

Choices:

(a) Two real solutions.

(b) One real solution.

(c) Four real solutions.

(d) Three real solutions.

(e) No real solutions.

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13. Find the x and y-intercepts of the graph of

$$x + y^2 - 4 = 0$$

Choices:

(a) The x intercepts are $x = 2$ and $x = -2$ and the y intercept is $y = 4$.

(b) The x intercept is $x = 4$ and the y intercept is $y = 2$.

(c) The x intercept is $x = 4$ and there are no y intercepts.

(d) The x intercept is $x = 4$ and the y intercepts are $y = 2$, and $y = -2$.

(e) The x intercept is $x = -4$ and the y intercepts are $y = 2$, and $y = -2$.

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14. Which one of the following statements is not true?

Choices:

(a) $\sqrt{x^2} = x$ for all real numbers x.

(b) $|x - y| = |y - x|$ for all real numbers x and y.

(c) a has two square roots for all real numbers $a > 0$.

(d) $|a|$ can never be negative for all real numbers a.

(e) $\sqrt{a^2} = |a|$ for all real numbers a.

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15. Which one of the equations represents the statement that the distance from -2 to a number x on the number line is 7?

Choices:

(a) $|x - 7| = 2$

(b) $|7 + x| = 2$

(c) $|x - 2| = 7$

(d) $|x + 2| = 7$

(e) $|7 - 2| = x$

Short Answer: Show your work below and place the appropriate answer on front page for each of the following.

16. Solve the equation for x. Include all solutions in your answer on the front of the exam.

$$\frac{1}{x+1} + \frac{3}{(x+1)(x+3)} = \frac{2}{x+3}$$

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17. Find the center of the circle

$$x^2 - 2x + y^2 + 6y - 10 = 0.$$

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18. Solve the equation for R.

$$\frac{1}{R} = \frac{1}{V} + \frac{1}{W}$$

19. Find all real solutions to the equation $x^4 - 5x^2 + 4 = 0$.

20. Solve for s.

$$\frac{8 - 2s}{5} = 17$$