MA 109   Fall 2013

Exam 1   September 25, 2013

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:

$$\textbf{A}\; \text{B}\; \text{C}\; \text{D}\; \text{E}.$$

- 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!

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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. $\boxed{-6, 20}$

16. $\boxed{n = \sqrt[3]{\dfrac{F}{P}} - 1}$

17. $\boxed{\textit{any point for which } x \cdot y = 12.}$

18. $\boxed{y + 1 = \dfrac{3}{7}(x - 2)}$

19. $\boxed{\pm 2, \pm 1}$

20. $\boxed{-\dfrac{77}{2}}$

For grading use:

Total	
	(out of 100 pts)

Name: _____ **Section:** _____

1. A line goes through the points $(1, 2)$, $(3, 7)$ and $(-1, -3)$. What is the slope of the line?

   Choices:

   (a) $\dfrac{1}{6}$

   (b) -2.5

   (c) $\dfrac{2}{5}$

   (d) $\dfrac{5}{2}$

   (e) -6

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2. For which of the following equations is -2 a solution?

   Choices:

   (a) $2x - 4 = 0$

   (b) $3x^2 - 6 = 0$

   (c) $2x^2 + 8x + 23 = 15$

   (d) $\dfrac{4}{x} + 3 = \dfrac{1}{x + 2}$

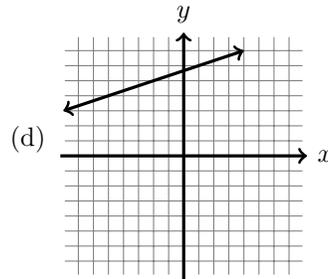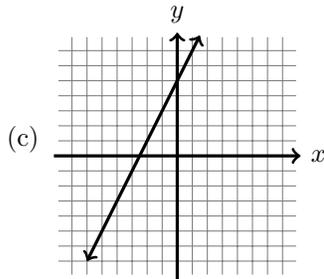   (e) $3(4 - x) = 6$

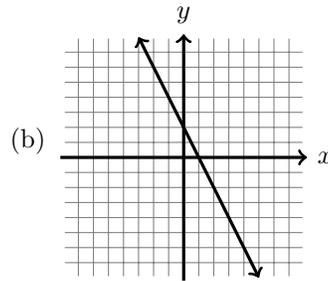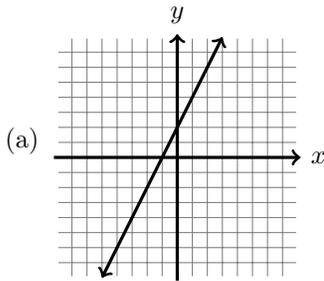3. Solve the following equation for x.
$$3x^2 + 2x = 12$$

   Choices:

   (a) $-2 \pm \dfrac{\sqrt{140}}{6}$

   (b) $\dfrac{-2 \pm \sqrt{148}}{6}$

   (c) There are no real solutions.

   (d) $2 \pm \dfrac{\sqrt{148}}{6}$

   (e) $\dfrac{2 \pm \sqrt{140}}{6}$

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4. Which of the following is the graph of the equation $y + 1 = 2(x + 3)$?

Choices:

(a)

(b)

(c)

(d)

(e)
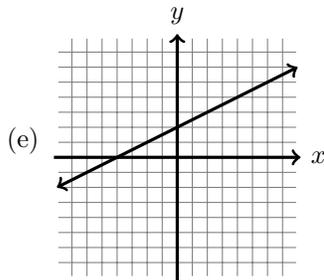
5. Given the equation $x^2 + 6x + k = 0$, for what value of k is there exactly one real solution?

Choices:

   (a) -3
   (b) -4
   (c) 1
   (d) 9
   (e) 6

6. Solve for s.
$$(s - 2)^5 + 3 = 11$$

Choices:

    (a) $\sqrt[5]{10}$

    (b) $2 + \sqrt[5]{8}$

    (c) $2 \pm \sqrt{8}$

    (d) $2 \pm \sqrt[5]{8}$

    (e) $\pm\sqrt{10}$

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7. Solve for p.
$$(3p + 7)(27 - p^3) = 0$$

Choices:

    (a)   The real solutions are $-\dfrac{7}{3}$ and 3.

    (b)   The only real solution is 9.

    (c)   The real solutions are $\pm\sqrt{27}$.

    (d)   There are no real solutions.

    (e)   The real solutions are $-\dfrac{7}{3}$ and 9.

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8. The point $(2, 1)$ is the midpoint of $(3, 4)$ and what other point?

Choices:

    (a) $(-1, 2.5)$

    (b) $(0, 3)$

    (c) $(1, -2)$

    (d) $(2.5, 2.5)$

    (e) $(4, 7)$

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9. Solve the following equation for z.

$$\sqrt{13 - 4z} = z - 4$$

Choices:

(a) The only real solutions are $\dfrac{-4 \pm \sqrt{132}}{2}$.

(b) There are no real solutions.

(c) The only real solution is $\dfrac{17}{5}$.

(d) The only real solutions are 1 and 3.

(e) The only real solution is -1.

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10. In the following equation, solve for y.

$$\frac{3}{y - 1} + \frac{4}{y^2 - 2y + 1} = 1$$

Choices:

(a) The only real solution is $\frac{8}{3}$.

(b) The real solutions are 0 and 5.

(c) The only real solution is -1.

(d) The only real solution is -2.

(e) The real solutions are 1 and 2.

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11. A circle has center $(2, 7)$ and intersects the x-axis at $x = 2$. Which of the choices below is an equation for the circle?

Choices:

(a) $(x + 2)^2 + (y + 7)^2 = 4$

(b) $(x - 2)^2 + (y - 7)^2 = 49$

(c) $(x + 2)^2 + (y + 7)^2 = 7$

(d) $(x - 2)^2 + (y - 7)^2 = 4$

(e) $(x + 2)^2 + (y + 7)^2 = 49$

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

   Choices:

   (a)   Two real solutions

   (b)   One real solution

   (c)   Four real solutions

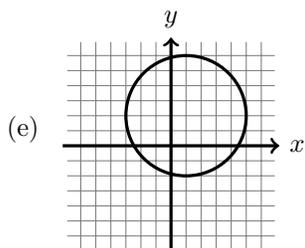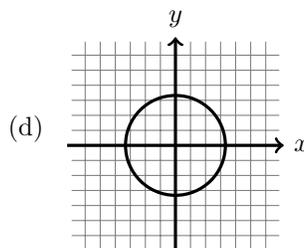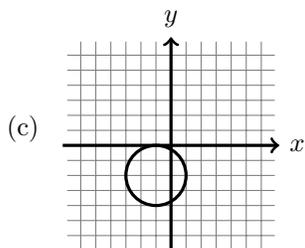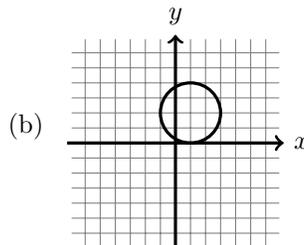   (d)   Three real solutions

   (e)   No real solutions

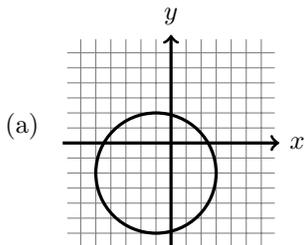
13. List the x-intercept(s) of the graph of $x + y^2 - 4 = 0$.

   Choices:

   (a)   Only $(0, -2)$

   (b)   Only $(0, 0)$

   (c)   Both $(0, 2)$ and $(0, -2)$

   (d)   Only $(4, 0)$

   (e)   Both $(4, 0)$ and $(-4, 0)$

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14. Which of the following is the graph of the equation $x^2 - 2x + y^2 - 4y - 11 = 0$?

   Choices:

   (a)

   (b)

   (c)

   (d)

   (e)

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

$$|7 - x| = 13$$

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16. Solve the equation for n.

$$F = P(1 + n)^3$$

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17. Name one point on the graph of the equation $xy = 12$. (Do NOT list more than one point. Your answer should be exact, i.e. do not round.)

18. Give an equation for the line which goes through the point $(2, -1)$ and is perpendicular to the line $y = \dfrac{-7}{3}x - 1$.

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

20. Solve for s.
$$\frac{8 - 2s}{5} = 17$$