**Name:**
**Recitation Instructor, Day, Time:**

# TRADITIONAL MATH 100 – Exam 2 - October 13, 2015

**Directions:** You will find 13 problems listed below. No notes/books/friends are allowed. Graphing calculator models above the level of a TI-84 plus are not allowed. You have one hour to complete this exam.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | TOTAL |
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1. (6 points) Find the solutions and check your answers: $|4x - 9| = x + 5$.

2. (6 points) Find the solutions to $3x^2 + x - 5 = 0$.

3. (8 points) Solve: $|2x - 9| > 17$.

4. (10 points) Given that $x = 5$ is one zero of $p(x) = 2x^3 - 16x^2 - 26x + 280$, find all the other zeros, real or complex, of $p(x)$.

5. (6 points) Simplify and write in standard $a + bi$ form: $(-8 - i) - (14 + 3i)$

6. (10 points) The profit function for selling $x$ units of a certain product is given by $P(x) = -x^2 + 1600x + 960,000$. What number of units generates maximum profit, and, what is the maximum profit? Show your work with algebra. If you choose to use a graph as part of your work, you must include a graph having the pertinent information that helps to answer this question.

7. (10 points) Consider the polynomial $p(x) = 200x^4 - 12x^3 + 2x + 200$. Circle TRUE or FALSE for each of the statements below.

   (a) TRUE FALSE $p(x)$ has even degree.

   (b) TRUE FALSE $p(x)$ has a positive y-intercept.

   (c) TRUE FALSE $p(x)$ has negative leading coefficient.

   (d) TRUE FALSE As $x \to \infty$, $p(x) \to \infty$.

   (e) TRUE FALSE As $x \to -\infty$, $p(x) \to \infty$.

8. (8 points) A parabola has vertex at $(-3, 9)$ and passes through the point $(2, 14)$. What is the equation of the parabola? Write your answer in the form $y = a(x-h)^2 + k$. DO NOT MULTIPLY OUT.

9. (6 points) Using the **REMAINDER THEOREM**, find $p(-1)$ when $p(x) = 2x^4 - x^2 + 4x - 1$. Be sure to identify your final answer.

10. (6 points) Simplify $i^{1243}$.

11. (8 points) Solve: $|5x + 6| < 12$.

12. (8 points) Solve the quadratic inequality $x^2 - 6x < 7$.

13. (8 points) Find all solutions to the polynomial equation $x^4 - 14x^2 + 24 = 0$. Leave answers in radical form.