Math 105 Precalculus
Quiz 4, Section 2.5

October 15, 2009

Name ANSWER KEY A

Please show all work neatly. Use of calculators is not permitted. Please put your answers on the lines provided.

All questions on this quiz concern the quadratic function \( f(x) = -x^2 + 6x - 8 \).

1. Express the function \( f(x) \) in standard form.
   \[
   f(x) = -1(x^2 - 6x) - 8 = -1(x^2 - 6x + 9 - 9) - 8
   = -(x^2 - 6x + 9) + 1 = -(x - 3)^2 + 1
   \]

2. What is the vertex of the function (both \( x \) and \( y \) coordinates)? \((3, 1)\)

3. What is the \( y \)-intercept? \( y = -8 \) \((0, -8)\)

4. What is/are the \( x \)-intercept(s), if any? \( x = 2, x = 4 \)

5. Does the parabola open up or down? Down. How do you know? \( a = -1 \) (less than 0).

6. Explain in words (in terms of function transformations) how the graph of \( f(x) = -x^2 + 6x - 8 \) is obtained from the graph of \( g(x) = x^2 \).
   I. Shift 3 to right
   II. Reflect across x-axis.
   III. Move up by 1.

7. Graph the function \( f(x) = -x^2 + 6x - 8 \), showing all information you found above.
   Note: you may turn the graph paper sideways if it is easier.

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Graph using findings from parts 2, 3, 4.