Name: _____

Score: _____ /15

Worksheet 8 (Due Fri, May 16)

Math 1060Q – Summer 2014

Professor Hohn

You must show all of your work to receive full credit!

1. Factor the following quadratic equations.

    (a) $x^2 - 3x - 10$

    (b) $x^2 + 5x + 4$

    (c) $2x^2 - 8x - 42$

2. Find all values of x that satisfy the equation $x^2 - 5x + 6 < 0$.

3. Find all values of x that satisfy the equation $x^2 + 1 \leqslant 2x$.

4. Find all values of x that satisfy the equation $-2x^2 + 8x - 24 > 0$.

5. Find all values of x that satisfy the equation $-x^2 - x > -12$.

6. Let $f(x) = x^2 + 12x - 10$.

   (a) Write $f(x)$ in the form $a(x - h)^2 + k$.

   (b) Find the value of x where $f(x)$ attains its minimum or maximum value.

7. Let $f(x) = x^2 - 8x + 14$.

   (a) Write $f(x)$ in the form $a(x - h)^2 + k$.

   (b) Find the value of x where $f(x)$ attains its minimum or maximum value.

8. Let $f(x) = x^2 + x - 1$.

   (a) Write $f(x)$ in the form $a(x - h)^2 + k$.

   (b) Find the value of x where $f(x)$ attains its minimum or maximum value.

9. Let $f(x) = -x^2 - 100x + 100$.

   (a) Write $f(x)$ in the form $a(x - h)^2 + k$.

   (b) Find the value of x where $f(x)$ attains its minimum or maximum value.

10. Let $f(x) = x^2 + 7x + \frac{1}{2}$.

    (a) Write $f(x)$ in the form $a(x - h)^2 + k$.

    (b) Find the value of x where $f(x)$ attains its minimum or maximum value.

11. Let $f(x) = 3x^2 + 3x + 7$.

    (a) Write $f(x)$ in the form $a(x - h)^2 + k$.

    (b) Find the value of x where $f(x)$ attains its minimum or maximum value.

12. Let $f(x) = -10x^2 + 100x - 1000$.

    (a) Write $f(x)$ in the form $a(x-h)^2 + k$.

    (b) Find the value of x where $f(x)$ attains its minimum or maximum value.

13. Let $f(x) = 3x^2 + 4x + 5$.

    (a) Write $f(x)$ in the form $a(x-h)^2 + k$.

    (b) Find the value of x where $f(x)$ attains its minimum or maximum value.

14. Suppose f is the function whose domain is the interval $[1, \infty)$ with

$$f(x) = x^2 + 4x + 5.$$

Find a formula for f^{-1}. What is the range of f? What is the range of f^{-1}?

15. Suppose g is the function whose domain is the interval $[\frac{3}{2}, \infty)$ with

$$g(x) = x^2 - 3x + 9.$$

Find a formula for g^{-1}. What is the range of g? What is the range of g^{-1}?

16. The height h in feet of a model rocket above the ground t seconds after lift-off is given by $h(t) = -5t^2 + 100t$, for $0 \leqslant t \leqslant 20$. When does the rocket reach its maximum height above the ground? What is its maximum height?