

Math 418: Worksheet 5

September 22, 2020

Directions: DO NOT DO YOUR WORK ON THIS SHEET. Justify ALL your answers.

- 1 Suppose $f(x) = 6x^2 + 12x - 9$. Find the vertex, axis of symmetry, x-intercept(s), y-intercept, the domain and range of $f(x)$.
- 2 Suppose $g(x) = x^2 + 2x + 3$. Write g in standard form and graph $y = g(x)$. Use your graph to find the range of g .
- 3 Find the vertex for $f(x) = 2(x + 1)(x - 4)$.
- 4 For which values of b will the quadratic function $f(x) = x^2 - 2bx + 10$ have a minimum value of 1?
- 5 Find a quadratic function $f(x)$ so that $f(2) = 10$ and $f(x)$ has vertex at $(\frac{-3}{4}, \frac{-41}{8})$.
- 6 By now you have learned many things about quadratic functions. Let's verify that the x coordinate of the vertex of $f(x) = ax^2 + bx + c$ is $x = \frac{-b}{2a}$.
 - I) Find the two solutions to $ax^2 + bx + c = 0$.
 - II) Explain why the symmetry of the parabola implies that the x-coordinate of the vertex can be found halfway between the two solutions you found in part I).
 - III) Take the average of your two solutions to find the x coordinate of the vertex.
 - IV) Does this agree with $x = \frac{-b}{2a}$?
 - V) This actually works for every value of a, b and c , but we did cheat a little bit, where is the one issue that might pop up?
- 7 Find a formula for a parabola passing through $(3, 5)$ with vertex at $(2, 9)$.
- 8 Find a formula for a parabola passing through $(2, 9)$ with vertex at $(3, 5)$.
- 9 Graph $y = 4x^2 + 2x - 12$
- 10 Find the domain and range for $f(x) = 3(x + 2)(x - 1)$