

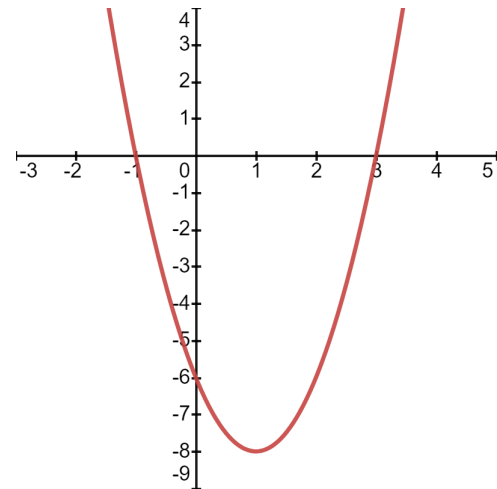
WORKSHEET 2: 18 points

Math 6B-030, Spring 2021

Due: Friday, April 16th, 11:59pm via Gradescope

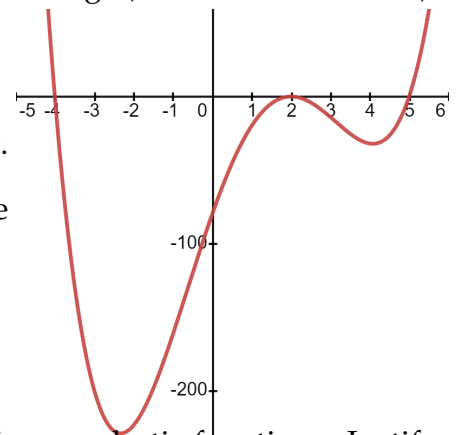
Question 1 (8 points) The quadratic polynomial, $p(x)$ is graphed below.

- (2 points)** Describe all transformations done to $f(x) = x^2$ to get $p(x)$. Be precise. Include the order in which the transformations were done.
- (2 points)** Write an equation for $p(x)$ in factored form.
- (1 point)** Write an equation for $p(x)$ in vertex form
- (1 point)** Write an equation for $p(x)$ in standard form. Justify by showing all work.
- (2 points)** Verify your solutions in (b)-(d) by checking at least 2 points (not both $y = 0$). Show your calculations. If your answers do not agree with the graph, go back and check your work.



Question 2 (5 points) The graph of $f(x)$ is given below. Assume f is defined for all real numbers and continues the behavior seen in the graph (so if f is increasing/decreasing when it leaves the graphing window it continues to increase/decrease). Use the graph to estimate the location(s) of the following features up to the nearest 0.5 (half integer) or $\pm\infty$, if relevant).

- (2 points)** intervals where $f(x)$ is increasing and decreasing.
- (2 points)** intervals where $f(x)$ is concave up and concave down.
- (1 point)** x-values where $f(x)$ has inflection points.



Question 3 (5 points) Determine all real zeros (roots) of the following quadratic functions. Justify all of your answers completely. Correct root(s) with no justification will receive no credit. Solve by hand.

- (1 point)** $a(x) = -4x^2 - 64$
- (1 point)** $b(x) = (x - 9)^2$
- (1 point)** $c(x) = 3(x - 6)^2 - 27$
- (2 points)** $d(x) = 4x^2 - 3x - 1$