NAME: Solution

MAC 1147 Section 3077
Quiz Six

Please show all of your work in a NEAT and ORGANIZED fashion.

1. (a) (2 points) Write the standard form of the quadratic function $f(x)$ that has vertex $(-1, 5)$ and passes through the point $(0, 2)$.

$f(x) = a(x-h)^2+k$

$f(x) = a(x+1)^2+5$

$f(x) = -3(x+1)^2+5$

$2 = a(0+1)^2+5$

$-3 = a(1^2)$

$a = \frac{-3}{1} = -3$

(b) (1 point) Find the x-intercept(s) of the graph of $f(x)$.

$-3(x+1)^2+5 = 0$

$-3(x+1)^2 = -5$

$(x+1)^2 = \frac{5}{3}$

$x+1 = \pm\sqrt{\frac{5}{3}} \longrightarrow x = -1 \pm \sqrt{\frac{5}{3}}$

2. (3 points) Use the functions $f(x) = \frac{1}{8}x - 3$ and $g(x) = x^3$ to find the function $g^{-1} \circ f^{-1}$.

$f(x) = \frac{1}{8}x - 3$

$\longrightarrow x = \frac{1}{8}y - 3$

$x+3 = \frac{1}{8}y$

$f^{-1}(x) = 8x+24$

$g(x) = x^3$

$\longrightarrow x = y^3$

$g^{-1}(x) = \sqrt[3]{x}$

$(g^{-1} \circ f^{-1})(x) =$

$g^{-1}(f^{-1}(x)) =$

$g^{-1}(8x+24) =$

$\sqrt[3]{8x+24}$

3. (3 points) Find the rational zeros of the function $g(x) = 2x^3-3x^2-17x-12$.

List of possible zeros: $\pm \frac{1, 2, 3, 4, 6, 12}{1, 2}$

-1	2	-3	-17	-12
		-2	5	12
	2	-5	-12	0 ✓

$2x^2-5x-12 = 0$

$2x^2-8x+3x-12 = 0$

$2x(x-4)+3(x-4) = 0$

$(2x+3)(x-4) = 0$

$x = -\frac{3}{2}, 4 \longrightarrow \boxed{-\frac{3}{2}, -1, 4}$