MATH 162 Quiz 5 NAME:

1. Given $f(x) = x^2 - 4$ and $g(x) = \sqrt{3x}$, find $(f \circ g)(x)$ and $(g \circ f)(x)$. Also find their domains.

• $(f \circ g)(x) = \sqrt{3x}^2 - 4 = 3x - 4$ and $(g \circ f)(x) = \sqrt{3(x^2 - 4)}$. The domain of $(f \circ g)$ is the set of all x in the domain of g for which $g(x)$ belongs to the domain of f. Hence the domain of $(f \circ g) = [0, \infty)$. Similarly, the domain of $(g \circ f) = (-\infty, -2] \cup [2, \infty)$.

2. Given $f(x) = 7 - 2x$, find the inverse of f.

• First interchange x and y in $y = 7 - 2x$ to get $x = 7 - 2y$. Solving the last equation for y in terms of x, $f^{(-1)}(x) = \frac{7-x}{2}$.

3. Sketch $f(x) = -x^3 + 3x^2 + 10x$. Show your work.

• $f(x) = -x(x^2 - 3x - 10) = -x(x - 5)(x + 2)$. Checking the signs of f over the regions $(-\infty, -2)$, $(-2, 0)$, $(0, 5)$ and $(5, \infty)$, we get the graph for f. See class note.