

# Quiz 3

## Math 111

Name:

Show *all* your work algebraically for each and simplify. No credit is given without supporting work.

1. Let  $f(x) = x^2 + 5$ , and let  $g(x) = f(x - 1)$ .

(a) [2] Write the rule of  $g(x)$  and simplify.

(b) [5] Find the difference quotient of  $f(x)$ . Recall the difference quotient is  $\frac{f(x+h) - f(x)}{h}$ .

2. [2] Without graphing, determine the vertex of the parabola described by  $y = -(x - \sqrt{2})^2 + \pi$  and state whether it opens upward or downward.

3. [5] Determine whether the function defined by  $f(x) = x(x^4 - x^2) + 4x$  is even, odd, or neither.

4. [6] Graph  $g(x) = -2(x + 2)^2 + 2$ . *Note: partial credit can be given if you tell me what you are doing!*

