

Name _____

Homework 4

Quadratic Functions

Polynomial Functions

Rational Functions

1. (8) Suppose the price of an item, p , and the quantity q of the item sold are related by the function $p = 60 - \frac{1}{4}q$. The cost of producing the item is \$8 per item, plus a fixed cost of \$50. How many items should be produced in order to maximize profit? What is the maximum profit that can be attained from producing and selling this item?

2. (5) Determine a polynomial *function*, $f(x)$, which has leading coefficient 5, has a zero $x = 4$ and whose graph also has x -intercepts at $(-6, 0)$ and $(2, 0)$.

3. (5) Factor the polynomial $p(x) = x^3 - 8x^2 + 16x - 5$ completely.

4. (2ea) Determine the degree and leading coefficient for the following polynomials.

(a) $f(x) = 4x^2 + 14x^3 - 5x^6 - 4x - 1$

Degree: _____

Leading coefficient: _____

(b) $P(x) = -2(x - 3)(x - 1)^2(x^2 + 2)$

Degree: _____

Leading coefficient: _____

(c) $p(x) = (-2x + 3)^2(3x - 1) + 2$

Degree: _____

Leading coefficient: _____

5. (8) Find all of the intercepts and asymptotes of the graph of $f(x) = \frac{5x + 4}{x + 2}$. Be sure to label what type of intercept and asymptote each is.

6. (8) Find all of the intercepts and asymptotes of the graph of $g(x) = \frac{3(x + 1)(x - 3)(x - 2)}{x^2 + 3x + 2}$. Be sure to label what type of intercept and asymptote each is.