Review for Final Exam - Part II

2 Polynomials

2.1 Quadratic Functions

2.1.1 Example

Find the maximum value of the function $f(x) = 2x^2 + 11x - 4$.

2.1.2 Example

Find a quadratic function $f(x) = ax^2 + bx + c$ whose vertex is $(2, 3)$ and goes through the point $(5, 5)$.

2.1.3 Example

A farmer has 300 feet of fencing to construct 6 rectangular pens. What is the maximum possible area of all 6 pens?

2.2 Polynomial Division

2.2.1 Example

Find the quotient and the remainder.

$$\frac{4x^3 + x^2 - 6x + 8}{x + 2}$$

2.2.2 Example

Find the quotient and the remainder.

$$\frac{6x^7 + 15x^3 + x - 8}{3x^2 + 7}$$

2.3 Finding Roots of Polynomials

2.3.1 Example

Let $P(x) = 5x^3 - 9x^2 + x - 14$. List all of the possible rational roots of $P(x)$ as given by the Rational Roots Theorem.

2.3.2 Example

Let $P(x) = 4x^4 - 7x + 6$. List all of the possible rational roots of $P(x)$ as given by the Rational Roots Theorem.