Quiz 5.1-2

1. (3 points) Determine whether the algebraic expression is a polynomial (Yes or No). If it is a polynomial, write the polynomial in standard form, determine the degree and state if it is a monomial, binomial or trinomial. If it is a polynomial with more than 3 terms, identify the expression as a polynomial.

$$3x^2y^2 + 2xy^4 + 4$$

2. (3 points) For the given function find $f(x+2)$

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

5.3 Dividing Polynomials; Synthetic Division

Divide and simplify

$$\frac{12p^4 + 15p^3 + 3p^2}{3p^2}$$

$\frac{13}{3}p^2 + 5p + 1$

$$42\overline{)4823}$$

114

$-\ 42$

62

42

203

$-\ 168$

35

$114 + \frac{35}{42}$

Divide and simplify

$$\frac{12a^2b^2 - 4a^2b + 3ab^2}{2a^2b^2}$$

$6 - \frac{2}{b} + \frac{3}{2a}$

$\frac{3}{2a} - \frac{2}{b} + 6$

You Try

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

Divide

$14\overline{)645}$ 645/14

Divide using long division

$$\frac{6x^3-11x^2-7x+2}{3x+2}$$

$2x^2-5x+1$

$3x+2\overline{)6x^3-11x^2-7x+2}$

$-(6x^3+4x^2)$

$-15x^2-7x+2$

$-(-15x^2-10x)$

$3x+2$

$3x+2$

Divide using long division

$$\frac{8-15x+x^2+4x^3+3x^5}{3+x^2}$$

$3x^3-5x+1$

$x^2+0x+3\overline{)3x^5+0x^4+4x^3+x^2-15x+8}$

$-(3x^5+0x^4+9x^3)$

$-5x^3+0x^2-15x+8$

$3x^3-5x+1+\frac{5}{x^2+3}$

x^2+0x+8

x^2+0x+3

5

You Try

$$\frac{2+12x^2-2x^3-5x^4+x^5}{x^2-2}$$

Use long division and synthetic Division (linear divisor)

$$\frac{2x^3-5x^2-7x+20}{x-3}$$

3 | 2 -5 -7 20
6 3 -12
2 1 -4 | 8

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

Use synthetic Division

$3x^3+11x^2+14$ divided by $x+4$

-4 | 3 11 0 14
-12 4 -16
3 -1 4 | -2

$3x^2-x+4-\left(\frac{2}{x+4}\right)$

Use synthetic Division

$$\frac{x^4-5x^3-6x^2+33x-15}{x-5}$$

Given

$$f(x) = 2x^4 - x^3 - 3x^2 + 13x - 4$$

$$g(x) = x^2 - 2$$

Find $\left(\frac{f}{g}\right)(x)$ $\left(\frac{f}{g}\right)(2)$

$\left(\frac{f}{g}\right)(x) = x^2 + 2x + 1$

Remainder Theorem

If f(x) is devided by x-c, then the remainder is f(c)

Use the remainder theorem to find the remainder if $f(x) = 2x^3 - 3x + 8$ is divided by $x + 3$

Factor Theorem

x - c is a factor of *f(x)* if and only if *f(c)=0*

Use the Factor Theorem to determine whether *x - c* is a factor of the given function for the given values of *c*. If *x - c* is a factor, then write *f* in factored form.

$$2x^3 - 3x^2 - 18x - 8$$

$c = -2$ $c = 5$