

Name: _____

Date: _____

Algebra II
Homework 49

Problem 1. For each function determine the long term behavior and the behavior near the origin by drawing a quick thumbnail sketch as we did in class. You do *not* need to include x -intercepts, but you *do* need to include the y -intercept!

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

(b) $g(x) = -2x^4 + 24x^3 - 7x^2 - 2x + 3$

(c) $p(x) = -\frac{1}{10}x^3 + 10x^2 - \frac{1}{2}x - 4$

(d) $\epsilon(x) = x^{19} - 200x^7 + 2000x^2 - 5x + 20$

(e) $\delta(x) = -x^{2002} + x^{170} - 3x^5 + 7x^2 + 11x + 13$

(f) $\Gamma(x) = 4x^8 - 3x^5 + 9x^3 - 2$

(g) $P(t) = -\frac{\pi}{4}t^5 - 2\pi t^2 + t + \pi$

(h) $\hat{F}(\xi) = 0.001\xi^{24} + 3.477\xi^5 - 0.913\xi + 1.231$

Problem 2. Draw a qualitatively accurate graph of each function. Be sure to label *both* the y -intercept and the x -intercepts. Explicitly state the highest and lowest order terms.

(a) $f(x) = (x+2)(x+1)(x-1)(x-2)$

(b) $g(x) = x(x+2)(x+1)(x-1)(x-2)$

(c) $h(t) = -2(t-3)^2(t+2)(t-1)^3$

(d) $F(x) = -3(x-3)(x+1)(x-1)(x-2)$

(e) $\Delta(x) = \frac{1}{4}(x-1)(x-2)(x-3)(x-4)$

(f) $p(x) = \frac{27}{8}\left(x - \frac{2}{3}\right)^3(x+1)(x-1)$

(g) $a(z) = -\frac{5}{6}(z+2)(z+1)(z-1)^2(z-3)$

(h) $G(x) = (1-x)(2-x)(3-x)$