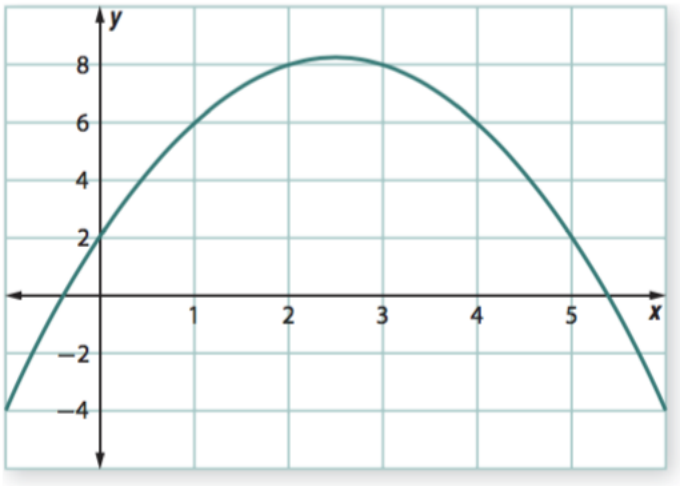
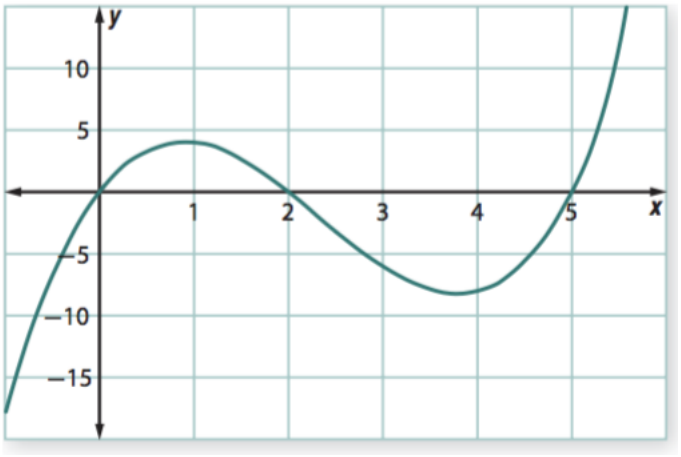
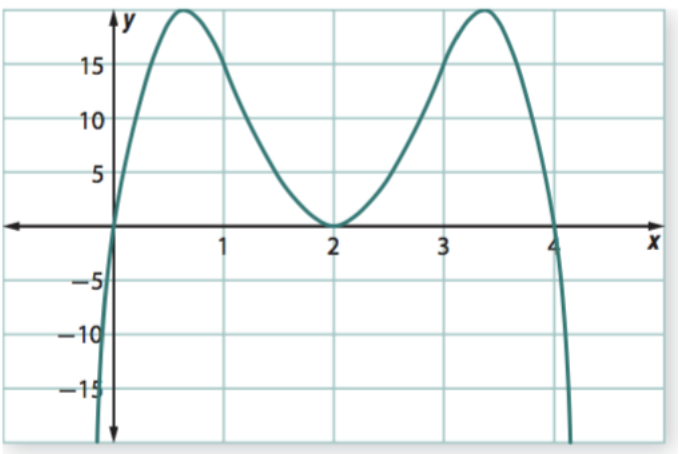
Math 3 Name _____

Polynomial Functions Worksheet Date _____

1. Use your calculator to find the equations for each curve. In each case list the points used in finding the model. Give the degree of each function.







2. Graph each function and then calculate or estimate coordinates of all:
    - Local Maximum points
    - Local Minimum points
    - x-intercepts
    - y-intercepts

a. $f(x) = 2x^2 + 4x + 1$

b. $g(x) = x^3+2x^2+3x+7$

c. $h(x) = x^3 - 6x^2 + 12x - 8$

d. $s(x) = x^4 - 8x^3 + 20x^2 - 16x$

3. For each algebraic expression:
    - Write an equivalent expression in standard polynomial form.
    - Give the degree of the polynomial

a. $(2x^2 + 5x - 2) + (-2x^2 + 3x + 7)$

c. $(2x^2 + 5x - 2) - (5x - 7)$

b. $(-7x^3 + 6x^2 + 3x - 7) - (3x^4 + 7x^3 + 4x^2 - 3x + 2)$

4. For each algebraic expression:
    - Write an equivalent expression in standard polynomial form.
    - Give the degree of the polynomial

a. $(7x + 3)(x - 1)$

b. $(3x + 5)^2 x^2$

c. $(7x^3 - 6x + 4)(2x^2 - 7)$

e. $(-3x^4 + 2x^2 + 6x)(7x^3 - 2x^2 + 5)$

5. For each function give the degree, find the zeros, local extrema, and y-intercept.

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

$g(x) = x^3 - 5x^2 + 2x - 4$

$h(x) = -x^3 - 4x^2 + 2x + 1$

6. Write a polynomial function in standard form of least degree with integral coefficients that has the given zeros.

a. 3, 2, -2

b. 3, 1, -2, -4

c. 5, -1, 0

d. -3, $-\frac{1}{3}$, 5

7. State the degree and list the zeros of the polynomial function. State the multiplicity of each zero and whether the graph crosses the x-axis at the corresponding x-intercept.

a. $f(x) = 3x(x-4)^2$

b. $g(x) = (x-1)(x+3)^3(x-7)^2$

c. $h(x) = x(2x+3)^4(x+5)^2$

d. $f(x) = (x-1)(x+9)^3(x+3)^4$