

Pre-Calculus Worksheet

Name: _____

Hodge-Podge Sections 2.1-2.3

Period: _____

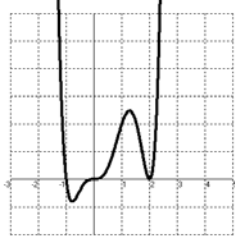
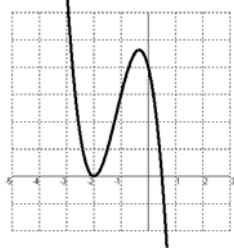
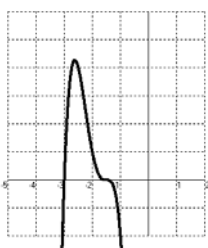
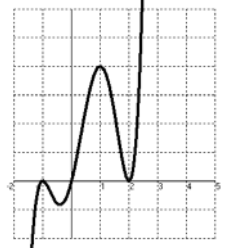
I. Miscellaneous Section 2.1 Problems.

<p>1. Graph the function $f(x) = -(x-3)^2 - 1$. Identify the direction of the opening and the coordinates of the vertex.</p>	<p>2. Identify the equation of a quadratic function with the vertex $(0, -\frac{1}{4})$ and that passes through the point $(3, -\frac{109}{4})$, opening downward.</p>
<p>3. Identify the equation of the quadratic function $f(x) = -12x + 4 - 3x^2$ in standard form and find the vertex of the graph.</p>	<p>4. Chemco Manufacturing estimates that its profit P in hundreds of dollars is $P = -4x^2 + 40x + 3$ where x is the number of units produced in thousands. How many units must be produced to obtain the maximum profit?</p>

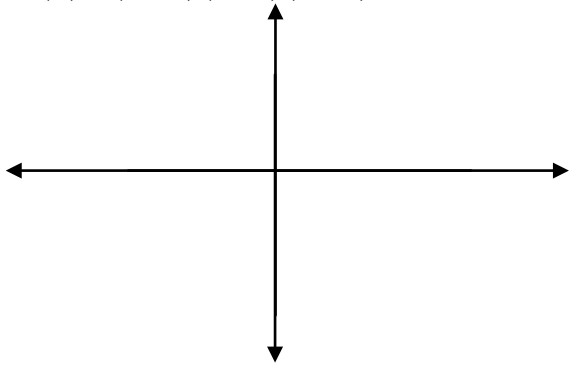
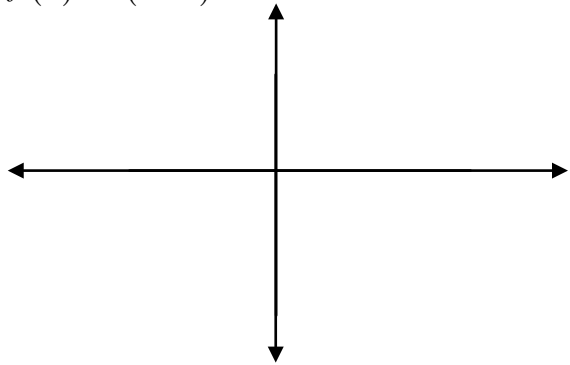
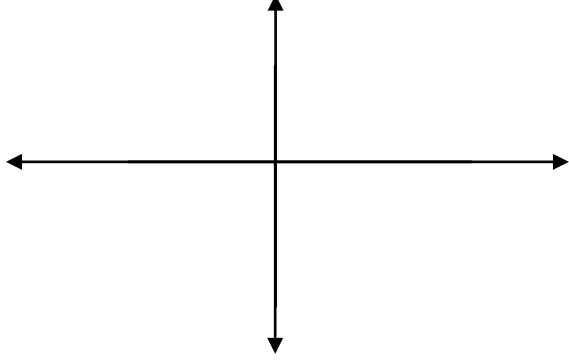
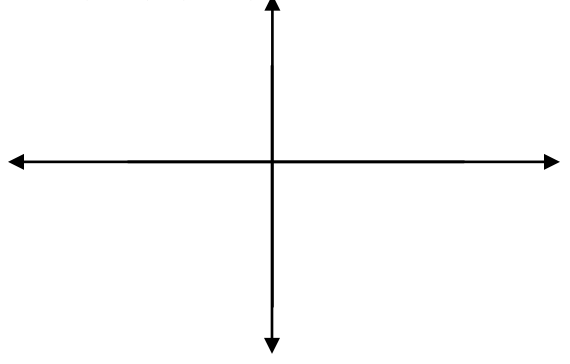
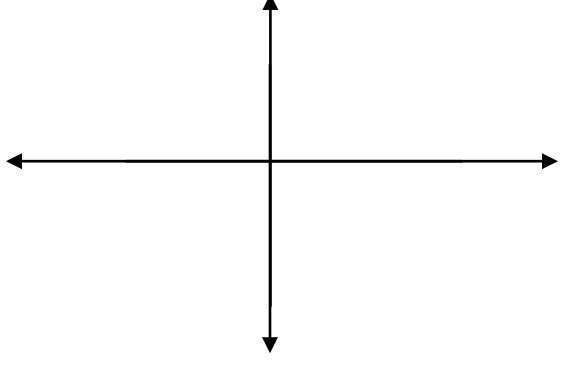
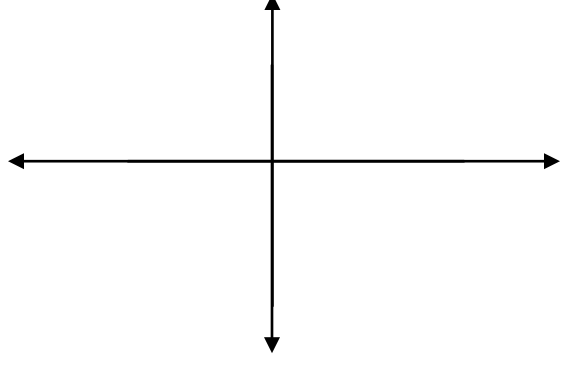
II. Use a graphing utility to graph each function. Determine each zero and the number of relative extrema. Then express the function as a product of linear factors.

<p>5. $f(x) = -x^3 + 3x^2 + 4x - 12$</p> <p>Real zeroes: _____ Number of Relative Extrema: _____ Factored Form of Equation: _____</p>	<p>6. $f(x) = x^4 + 6x^3 + 9x^2$</p> <p>Real zeroes: _____ Number of Relative Extrema: _____ Factored Form of Equation: _____</p>
<p>7. $f(x) = 2x^4 + 5x^3 - 17x^2 - 14x + 24$</p> <p>Real zeroes: _____ Number of Relative Extrema: _____ Factored Form of Equation: _____</p>	<p>8. $f(x) = -x^5 + x^4 + 12x^3$</p> <p>Real zeroes: _____ Number of Relative Extrema: _____ Factored Form of Equation: _____</p>

III. Determine an equation for the polynomial graph.

<p>9. Degree 6</p> 	<p>10. Degree 3</p> 	<p>11. Degree 4</p> 	<p>12. Degree 5</p> 
--	---	--	---

IV. Graph each function **WITHOUT** using a graphing utility.

<p>13. $f(x) = (x-2)(x+1)(x-4)$</p> 	<p>14. $f(x) = -(x+3)^2$</p> 
<p>15. $f(x) = (x-2)^3(2x+1)^2(x-4)^2$</p> 	<p>16. $y = -(x-1)^2(x+4)$</p> 
<p>17. $f(x) = 9x^3 - 25x$</p> 	<p>18. $y = -4x^3 + 4x^2 + 15x$</p> 

V. Miscellaneous Problems from Section 2.3.

19. Use synthetic substitution OR your calculator to evaluate $f(x) = 20x^4 - 8x^3 + 25x^2 + 50x - 16$ for $f\left(-\frac{5}{2}\right)$.

20. Use synthetic substitution OR your calculator to evaluate $h(x) = 2x^3 + 3x^2 - 7x + 1$ for $h(0.7)$.

21. Use synthetic division.
 $(3x^3 - 5x^2 + x - 2) \div (x - 2)$

Is $(x - 2)$ a factor of the polynomial? Why or why not?

22. Use synthetic division.
 $(3x^4 + 7x^3 - 10x + 4) \div (3x - 2)$

Is $(3x - 2)$ a factor of the polynomial? Why or why not?

23. Determine k so that the function $h(x) = 2x^3 + 5x^2 + kx - 16$ has the binomial factor $x - 2$.

24. Determine k so that the function $h(x) = x^4 - 2x^3 - kx + 6$ has the binomial factor $x + 3$.

