Algebra 2 Worksheet Name: _____
Combo Day! Sections 6.5-6.7, 6.9 Period: ___

I. Use finite differences to determine the degree of the polynomial that best describes the data.

1.

x	y
-5	-20
-4	-19
-3	-9
-2	5.5
-1	20
0	30

2.

x	y
-2	-2
-1	-6
0	0
1	10
2	20
3	28

3.

x	y
-2	-3
-1	1
0	4.3
1	6.9
2	8.8
3	10

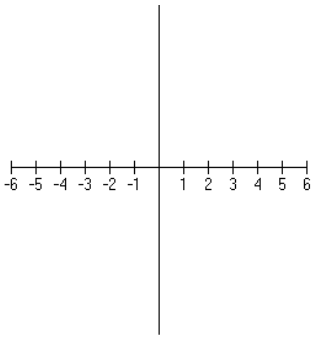
II. Application.

4. The table below shows the number of Canadian visitors to the United States. Use a polynomial model to predict the number of visitors in 2006. Be sure to include the equation of your polynomial model!

Year	1996	1998	2000	2001	2002	2003
Visitors (in millions)	15.3	13.4	14.6	13.5	13.0	12.7

III. Sketch a graph of each function WITHOUT using the calculator and find the requested info.

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



Root	Multiplicity
Ex. 0	2

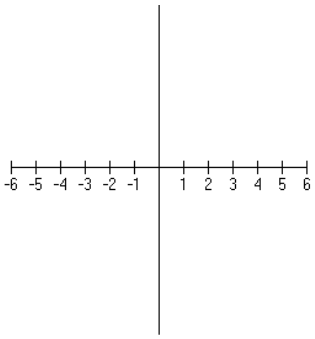
Degree of the Polynomial: _____

End Behavior:

$x \to -\infty,\ y \to$ _____

$x \to +\infty,\ y \to$ _____

6. $y = (2x+1)^2(x+3)$



Root	Multiplicity

Degree of the Polynomial: _____

End Behavior:

$x \to -\infty,\ y \to$ _____

$x \to +\infty,\ y \to$ _____

IV. Find the requested information for each polynomial graph. All polynomials are in standard form.

7. $P(x) = 8x^6 - 5x^5 + \ldots + x^2 - 10$	8. $P(x) = -2x^9 + 4x^8 + \ldots + 6x + 2$
Leading Coefficient: _____	Leading Coefficient: _____
Degree: _____ y-intercept: _____	Degree: _____ y-intercept: _____
Total Number of Roots: _____	Total Number of Roots: _____
End Behavior:	End Behavior:
$x \to -\infty,\ y \to$ _____	$x \to -\infty,\ y \to$ _____
$x \to +\infty,\ y \to$ _____	$x \to +\infty,\ y \to$ _____

V. Solve each of the polynomial equations by factoring to start…

9. $x^3 + 5x^2 - 27x - 135 = 0$	10. $x^4 - 7x^2 = 144$

VI. Find all of the roots. Give EXACT VALUES. You may use the calculator to help in your search.

11. $x^3 - 2x^2 - 41x - 56 = 0$	12. $2x^4 - x^3 + 95x^2 = 49x + 147$