

Name: Key

Date: \_\_\_\_\_

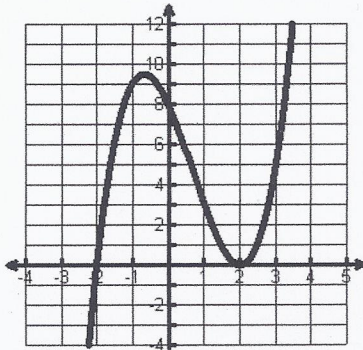
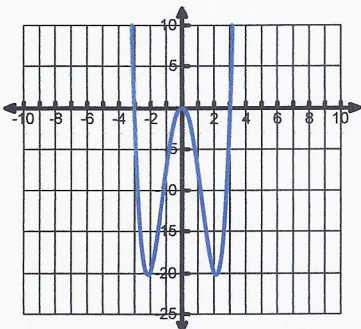
Complete the following table using each polynomial function:

Function	Leading Coeff (+ or -)	Degree	End Behavior
1. $f(x) = -4x^5 - x^2 - 8x + 12$	-4	5	As $x \rightarrow -\infty$ $f(x) \rightarrow \infty$ As $x \rightarrow \infty$ $f(x) \rightarrow -\infty$
2. $f(x) = 12x + 4 - 3x^3$	-3	3	As $x \rightarrow -\infty$ $f(x) \rightarrow \infty$ As $x \rightarrow \infty$ $f(x) \rightarrow -\infty$
3. $f(x) = 4x^2 - 2 - 2x^6 + x$	-2	6	As $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$ As $x \rightarrow \infty$ $f(x) \rightarrow -\infty$
4. $f(x) = 5x^3 - x + 3x^4 - 6 + 5x^2$	3	4	As $x \rightarrow -\infty$ $f(x) \rightarrow \infty$ As $x \rightarrow \infty$ $f(x) \rightarrow \infty$
5. $f(x) = -5x + 7 - 6x^2$	-6	2	As $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$ As $x \rightarrow \infty$ $f(x) \rightarrow -\infty$

Use the equations to answer the following:

Function	Degree	Max # of Extrema
6. $f(x) = x^3 - x^2 - 8x + 12$	3	2
7. $f(x) = -12x^2 + 4$	2	1
8. $f(x) = x^4 + 2x^3 - 5x^2 - 6x$	4	3

Given the graphs, state the Max # of Extrema and the Least Possible Degree

<p>9.</p> <p># of Extrema <u>2</u></p> <p>Least possible degree <u>3</u></p> 	<p>10.</p> <p># of Extrema <u>3</u></p> <p>Least possible degree <u>4</u></p> 
--	---

Degree - 1

Determine the end behavior and maximum number of extrema (u-turns) w/o calculator:

$f(x) = -8x^5 - 7x^3 + 3x - 7$ <i>neg, odd</i> 11. $x \rightarrow +\infty$ $f(x) \rightarrow -\infty$ extrema <u>4</u> $x \rightarrow -\infty$ $f(x) \rightarrow \infty$	$f(x) = 12 - 3x^3 + 5x^3 - 7x^4$ <i>neg, even</i> 12. $x \rightarrow +\infty$ $f(x) \rightarrow -\infty$ extrema <u>3</u> $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$
$f(x) = 1 - 3x - 2x^2 - 5x^3 + 7x^4 - 12x^5$ <i>neg, odd</i> 13. $x \rightarrow +\infty$ $f(x) \rightarrow -\infty$ extrema <u>4</u> $x \rightarrow -\infty$ $f(x) \rightarrow \infty$	$f(x) = -7x^3 + 343$ <i>neg, odd</i> 14. $x \rightarrow +\infty$ $f(x) \rightarrow -\infty$ extrema <u>2</u> $x \rightarrow -\infty$ $f(x) \rightarrow \infty$

Find the number of zeros, y-int, & end behavior. Sketch the graph:

15.  $x^4 - 13x^2 + 36 = 0$  *positive, even*  
 given zeros:  $-3, -2, 2, 3$

*Label graph w/ zeros & y-int!*

# of Zeros: 4 Y-Int: (0, 36)

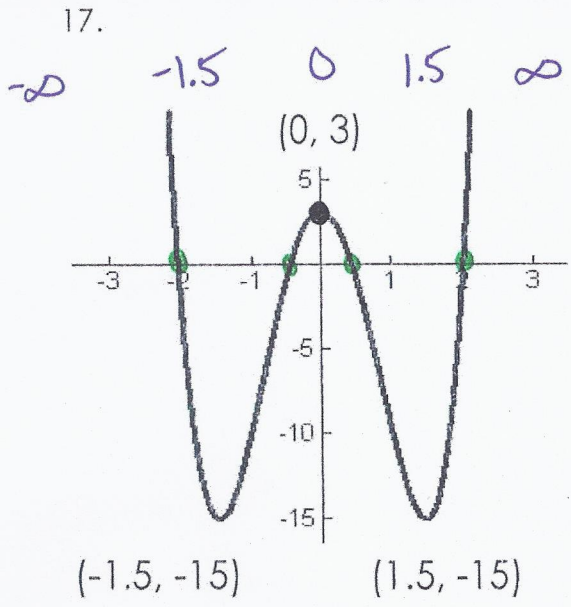
$x \rightarrow +\infty$   $f(x) \rightarrow \infty$   
 $x \rightarrow -\infty$   $f(x) \rightarrow \infty$  max # of extrema 3

16.  $x^3 - x^2 - 16x + 16 = 0$  *positive, odd*  
 given zeros:  $-4, 1, 4$

# of Zeros: 3 Y-Int: (0, 16)

$x \rightarrow +\infty$   $f(x) \rightarrow \infty$   
 $x \rightarrow -\infty$   $f(x) \rightarrow -\infty$  max # of extrema 2

Answer all of the following questions for the following graph:



Domain: $(-\infty, \infty)$	Range: $[-15, \infty)$
Increasing: $(-1.5, 0) \cup (1.5, \infty)$	Decreasing: $(-\infty, -1.5) \cup (0, 1.5)$
x-intercepts: $(-2, 0), (-0.5, 0), (0.5, 0), (2, 0)$	y-intercept: $(0, 3)$
Abs. Max: NA	Abs. Min: $(-1.5, -15)$ $(1.5, -15)$
Rel. Max: $(0, 3)$	Rel. Min: $(-1.5, -15)$ $(1.5, -15)$
Min. degree <u>4</u>	Sign of leading Coeff. <u>+</u>

3 extrema +1

*right side going up.*