

Name: _____

Date: _____

Complete the following table using each polynomial function:

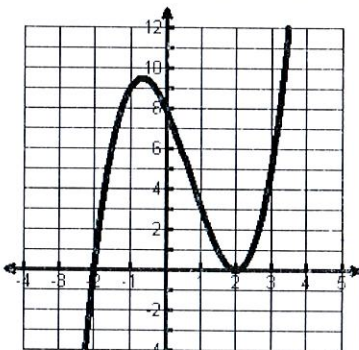
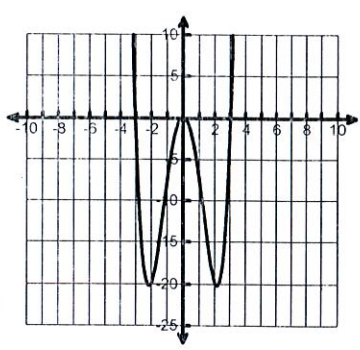
Function	Leading Coeff (+ or -)	Degree	End Behavior
1. $f(x) = x^3 - x^2 - 8x + 12$	+	3	As $x \rightarrow \infty f(x) \rightarrow \infty$ As $x \rightarrow -\infty f(x) \rightarrow -\infty$
2. $f(x) = 3x^3 - 12x + 4$	+	3	As $x \rightarrow \infty f(x) \rightarrow \infty$ As $x \rightarrow -\infty f(x)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

degree - one

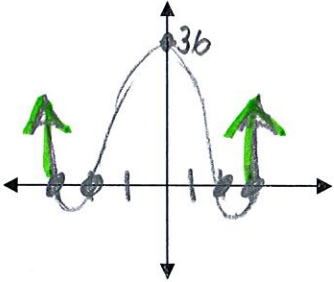
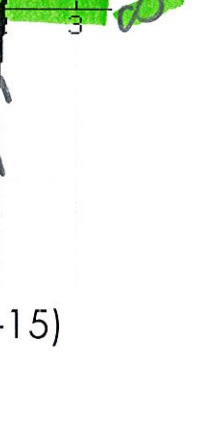
Given the graphs, state the Max # of Extrema and the Least Possible Degree

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

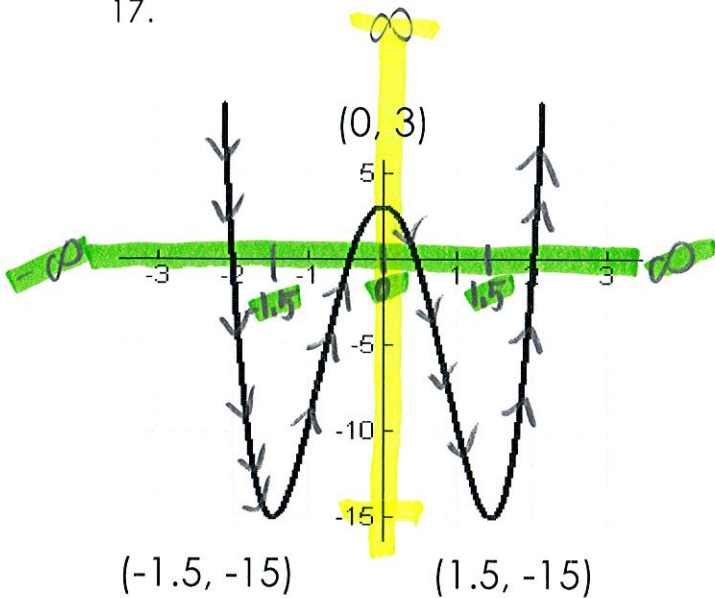
$f(x) = -8x^5 - 7x^3 + 3x - 7$ Neg & Odd 11. $x \rightarrow +\infty$ $f(x) \rightarrow -\infty$ $x \rightarrow -\infty$ $f(x) \rightarrow \infty$ extrema <u>4</u> max # <u>4</u>	$f(x) = 12 - 3x^3 + 5x^3 - 7x^4$ Neg & Even 12. $x \rightarrow +\infty$ $f(x) \rightarrow -\infty$ $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$ extrema <u>3</u>
$f(x) = 1 - 3x - 2x^2 - 5x^3 + 7x^4 - 12x^5$ Neg & Odd 13. $x \rightarrow +\infty$ $f(x) \rightarrow -\infty$ $x \rightarrow -\infty$ $f(x) \rightarrow +\infty$ extrema <u>4</u> max # <u>4</u>	$f(x) = -7x^3 + 343$ Neg & Odd 14. $x \rightarrow +\infty$ $f(x) \rightarrow -\infty$ $x \rightarrow -\infty$ $f(x) \rightarrow \infty$ extrema <u>2</u>

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

15. $x^4 - 13x^2 + 36 = 0$ Pos & Even given zeros: $-3, -2, 2, 3$  # of Zeros: <u>4</u> Y-Int: <u>(0, 36)</u> $x \rightarrow +\infty$ $f(x) \rightarrow \infty$ $x \rightarrow -\infty$ $f(x) \rightarrow \infty$ max # of extrema <u>3</u>	16. $x^3 - x^2 - 16x + 16 = 0$ Pos & Odd given zeros: $-4, 1, 4$  # of Zeros: <u>3</u> Y-Int: <u>(0, 16)</u> $x \rightarrow +\infty$ $f(x) \rightarrow \infty$ $x \rightarrow -\infty$ $f(x) \rightarrow -\infty$ max # of extrema <u>2</u>
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Answer all of the following questions for the following graph:

17.



Domain: $(-\infty, \infty)$	Range: $(-15, \infty)$
Increasing: $(-1.5, 0) (1.5, \infty)$	Decreasing: $(-\infty, -1.5) (0, 1.5)$
x-intercepts: $(-2, 0) (-1.5, 0)$ $(1.5, 0) (2, 0)$	y-intercept: $(0, 3)$
Abs. Max: <u>none</u>	Abs. Min: $(-1.5, -15) \& (1.5, -15)$
Rel. Max: $(0, 3)$	Rel. Min: <u>none</u>
Min. degree <u>4</u>	Sign of leading Coeff. <u>Positive</u>

turns plus one

b.c. $\uparrow\uparrow$