

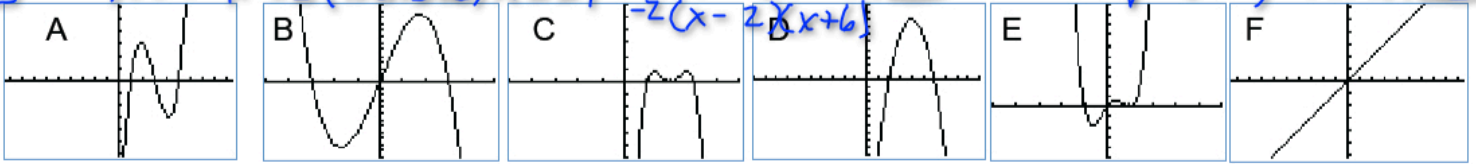
# 7.6 – Polynomial Graphs

## Practice 7.5

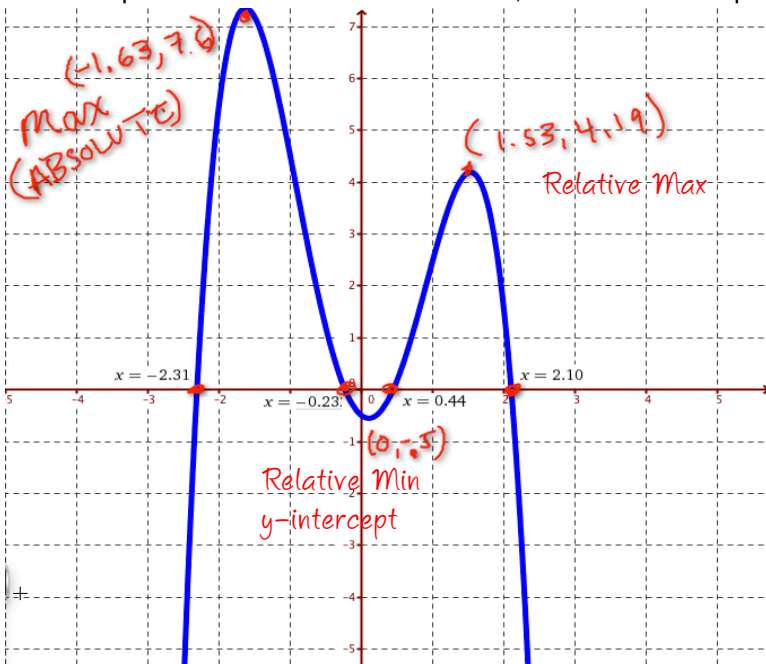
For each of the following, use the end behavior and x-intercepts to match the equation to its graph.

1.  $f(x) = x^3$  **(F)**  
 2.  $f(x) = (x-1)(x-3)(x-5)$  **(A)**  
 3.  $f(x) = -x^3 + 9x$   $x=0, \pm 3$  **(B)**  
 4.  $f(x) = -3(x-1)(x-2)^2(x-3)$  **(C)**  
 5.  $f(x) = -2x^2 + 16x - 24$   $x=1, x=2$  (Double),  $x=3$  **(D)**  
 6.  $f(x) = 3x^4 - 3x^3 - 3x^2 + 3x$  Degree = 4, Pos. Co. **(E)**

**(C)**



7. Graph the function. Label all extrema, zeros and intercepts. Round to the nearest hundredth, if necessary.



$$f(x) = -x^4 + 5x^2 - x - \frac{1}{2}$$

Roots:

$$x = -2.31066$$

$$x = -0.232543$$

$$x = 0.443087$$

$$x = 2.10011$$

X	Y1
-2.31	-33.5
-0.23	5.5
0.44	4.5
0.44	3.5
2.10	2.5
2.10	1.5
2.10	-39.5

As  $x \rightarrow -\infty, f(x) \rightarrow -\infty$   
 As  $x \rightarrow \infty, f(x) \rightarrow -\infty$

8. Graph the function. Label all extrema, zeros and intercepts. Round to the nearest hundredth, if necessary.

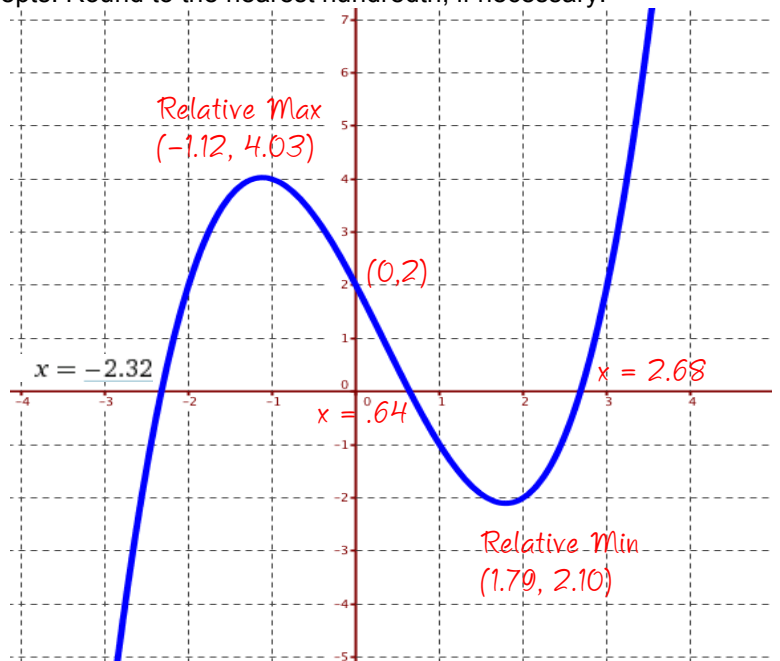
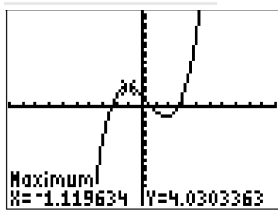
$$f(x) = \frac{1}{2}x^3 - \frac{1}{2}x^2 - 3x + 2$$

Roots:

$$x = -2.3234$$

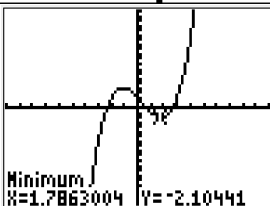
$$x = 0.642074$$

$$x = 2.68133$$



As  $x \rightarrow -\infty, f(x) \rightarrow -\infty$   
 As  $x \rightarrow \infty, f(x) \rightarrow \infty$

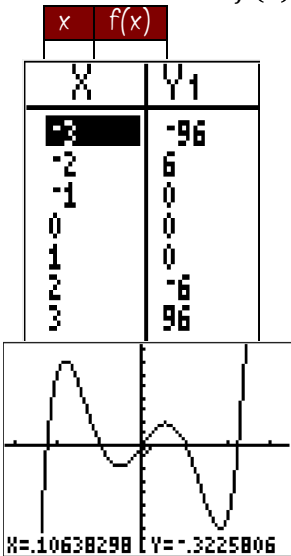
X	Y1
-2.32	-33.5
0.64	5.5
2.68	4.5
2.68	3.5
2.68	2.5
2.68	1.5
2.68	-39.5



# 7.6 – Polynomial Graphs

9. Graph the function. Label all extrema, zeros and intercepts. Round to the nearest hundredth, if necessary.

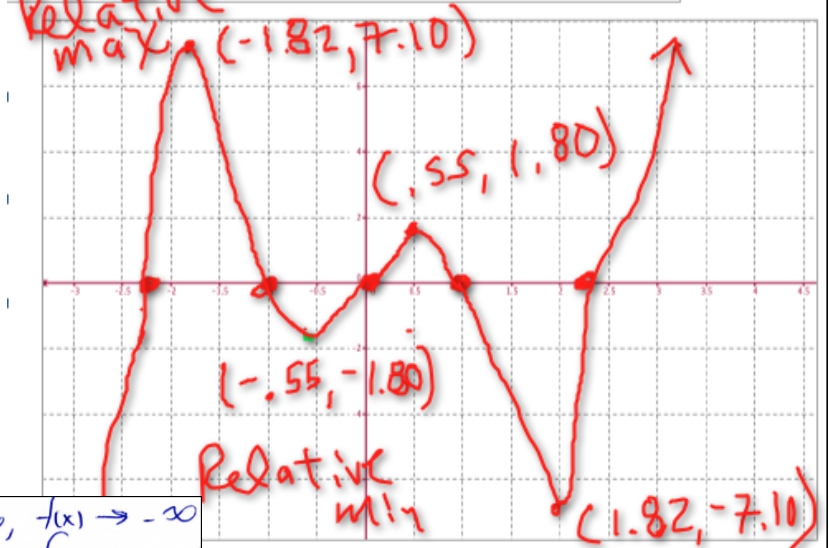
$$f(x) = x^5 - 6x^3 + 5x$$



Roots:

$x = -1$
$x = 0$
$x = 1$
$x = -\sqrt{5} \approx -2.24$
$x = \sqrt{5} \approx 2.24$

intercepts. Round to the nearest hundredth, if necessary.



y-int (0,0)

Zoom-Box!!!!

As  $x \rightarrow -\infty, f(x) \rightarrow -\infty$   
As  $x \rightarrow \infty, f(x) \rightarrow \infty$

10. Use your graphing calculator to find the zeros, intercepts and extrema of each function. Round to the nearest hundredth, if necessary. You do not have to graph the function.

Function	Degree	Leading Coefficient	Zeros	y-Intercept?	Extrema	
					Mins	Max
$f(x) = x^4 - 8x^2 - 12$ As $x \rightarrow -\infty, f(x) \rightarrow \infty$ As $x \rightarrow \infty, f(x) \rightarrow \infty$	4	1	$x = -3.05$ $x = 3.05$	(0,12)	(2,-28) (-2,-28) ABS	Local Max (0,12)
$f(x) = 3x^3 - 2x^2 + 2x$ As $x \rightarrow -\infty, f(x) \rightarrow -\infty$ As $x \rightarrow \infty, f(x) \rightarrow \infty$	3	3	$x = 0$ $x = -0.73$ $x = 2.73$	(0,0)	None	None
$f(x) = x(x - 20)(x + 15)(x - 12)$ As $x \rightarrow -\infty, f(x) \rightarrow \infty$ As $x \rightarrow \infty, f(x) \rightarrow \infty$	4	1	$x = 0$ $x = 20$ $x = 12$ $x = -15$	(0,0) ABS	(-9.58, -33144) Rel (16.71, -8210.88)	Local Max (5.62, 10631)
$f(x) = 8 - 2x^3 + 4x^2 - 5x$ As $x \rightarrow -\infty, f(x) \rightarrow \infty$ As $x \rightarrow \infty, f(x) \rightarrow -\infty$	3	-2	$x = 1.83$	(0,8)	None! ( $\infty$ )	None! ( $-\infty$ )
$f(x) = \frac{1}{200}x^4 + 2x - 1$ As $x \rightarrow -\infty, f(x) \rightarrow \infty$ As $x \rightarrow \infty, f(x) \rightarrow \infty$	4	(1/200)	$x = 7.53$ $x = .50$	(0, -1)	(-4.64, -7.96) ABS	None! ( $\infty$ )