NOTES: KEY FEATURES OF GRAPHS — DAY 2

Textbook Chapter 5.8

OBJECTIVE: To learn how to find the maximums, minimums, and intercepts on a graph!

VOCABULARY:

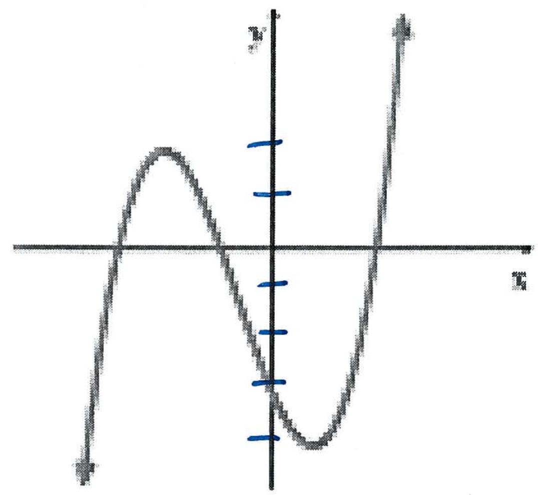
Turning Points: Point where the graph changes direction.
Relative Maximum: Turning point where the graph changes from increasing to decreasing. Relative Minimum: Turning point where the graph changes from decreasing to increasing.
Absolute Maximum: Highest point possible on the graph. Absolute Minimum: Lowest point possible on the graph.

1. Relative Max: 2

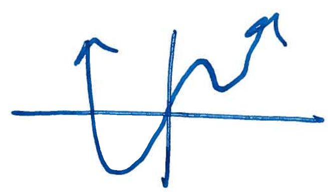
   Relative Min: -4

   Absolute Max: None

   Absolute Min: None



2. **Graph $3x^4 + x^3 - 10x^2 + 2x + 7$ using your calculator. Then sketch the graph:**



   a. List any zeros of the function — $x = -1.92, -0.78$

   b. List any **relative maximums** — 7.10

   c. List any **relative minimums** — -6.72, 2.82

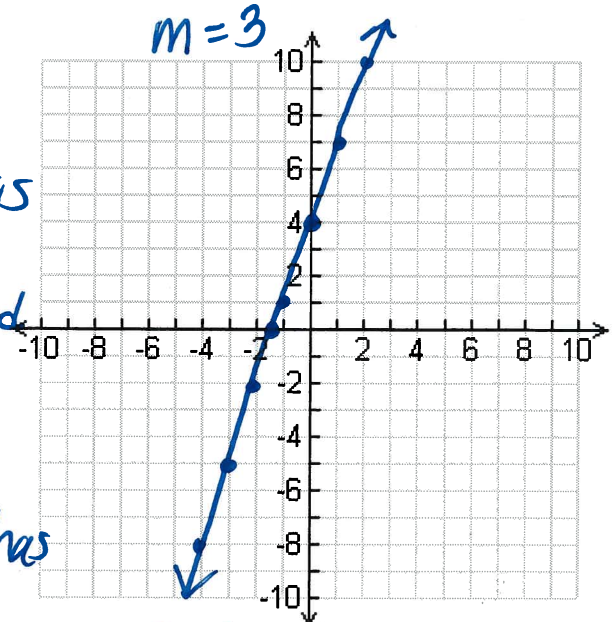
   d. List any **absolute maximums** — None

   e. List any **absolute minimums** — -6.72

NOTES: INTERCEPTS

3. Given the Equation: y = 3x + 4

$m=3$



a) What is true about every point on the x-axis? Find the x-intercept.

$0=3x+4$
$-4 \quad -4$
$\frac{-4}{3}=\frac{3x}{3}$
$\boxed{-\frac{4}{3}=x}$
$\left(-\frac{4}{3},0\right)$
x y

Every point on the x-axis has a y-coordinate of 0. Substitute 0 for y to find all x-intercepts.

b) What is true about every point on the y-axis? Find the y-intercept.

Every point on the y-axis has an x-coordinate of 0. Substitute 0 for y to find all y-intercepts.

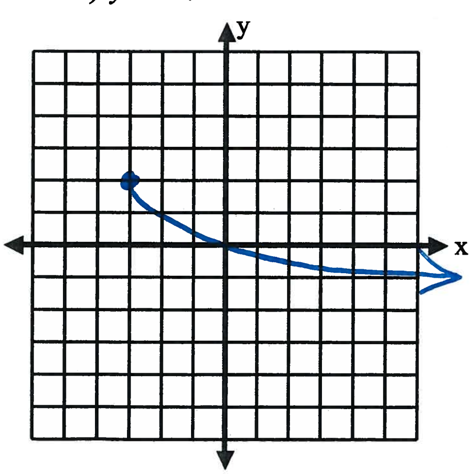
$y=3(0)+4$
$y=4 \rightarrow (0,4)$

c) Can there be more than one x-intercept or y-intercept in a function? Why/Why not?

There could be more than one x-intercept: (2,0) and (3,0) is still a function.
There could <u>not</u> be more than one y-intercept. (0,2) and (0,3) is not a function!

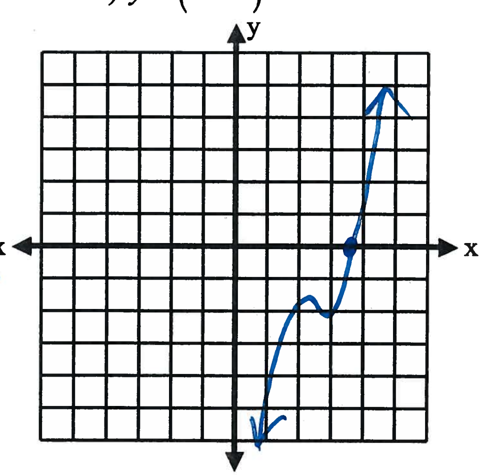
4. Using a calculator, graph each of the following.
Estimate the y-intercept and the zeros of the function (if they exist). → x-intercepts

a) $y=-\sqrt{x+3}+2$



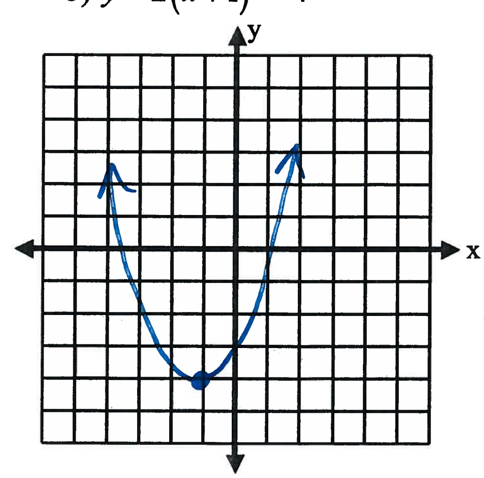
Y-intercept: 0.27
Zeros: 1

b) $y=(x-2)^3-3$



Y-intercept: -11
Zeros: 3.44

c) $y=2(x+1)^2-4$



Y-intercept: -2
Zeros: -2.41, 0.41

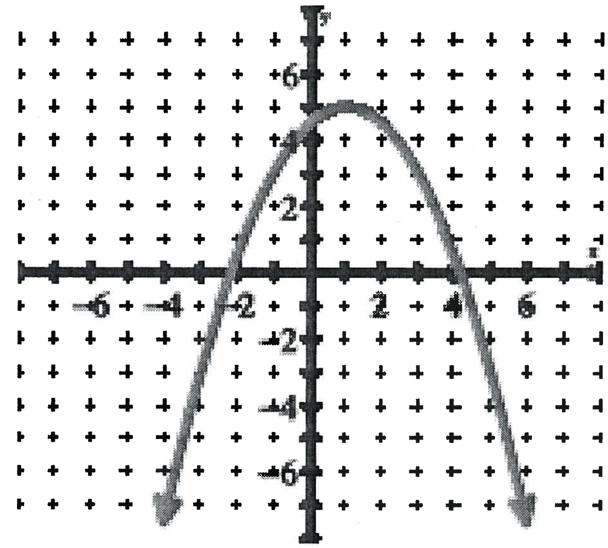
PRACTICE: **DAY 2**

1. Relative Max: 5

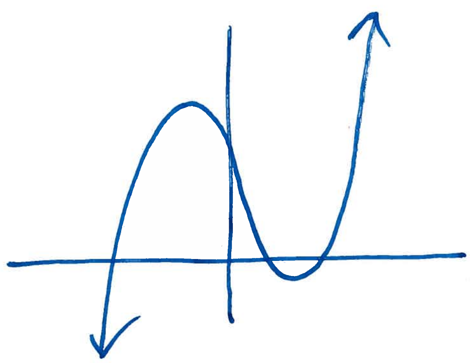
Relative Min: None

Absolute Max: 5

Absolute Min: None



2. Graph $x^3 - 9x^2 + 8x + 60$ using your calculator. Sketch its graph below.



a. List any zeros of the function (in coordinate form): X=-2, 5, 6

b. List any **relative maximums** (in coordinate form): 61.88

c. List any **relative minimums** (in coordinate form): -1.88

d. List any **absolute maximums** (in coordinate form): None

e. List any **absolute minimums** (in coordinate form): None

3. Identify the slope and y-intercept of each equation.

a. $y = -\frac{2}{3}x + 0$ slope $-2/3$ y-intercept 0

b. $f(x) = -x + 7$ slope -1 y-intercept 7

4. Identify the x-intercept and y-intercept for each equation.

a. 2x + 3y = 12

x	y
0	4
6	0

x-intercept (6,0) y-intercept (0,4)

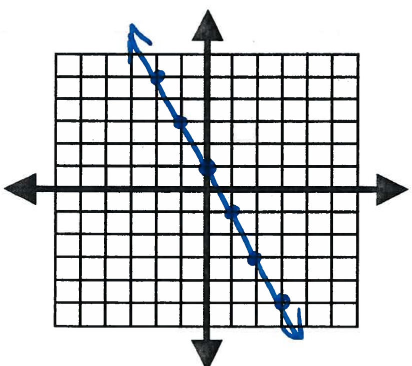
b. -7x - 2y = 14

x	y
0	-7
-2	0

x-intercept (-2,0) y-intercept (0,-7)

Graph each line.

5. $y = -2x + 1$

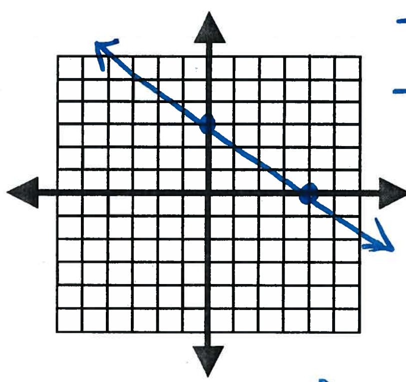


x-intercept: $(\frac{1}{2}, 0)$

y-intercept: (0,1)

6. $4y + 3x = 12$

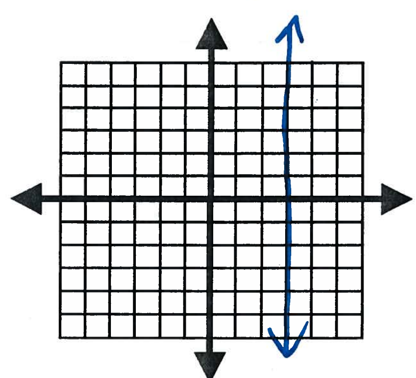
x	y
0	3
4	0



x-intercept: (4,0)

y-intercept: (0, 3)

7. $x = 3$ VUX



x-intercept: (3,0)

y-intercept: None