Section 1.6 KEY

3. $k = 7$

4. $m = 1.176$

5. $a = -\frac{10}{9}$

6. $k = 6.5$ (or $k = \frac{13}{2}$)

11. $y = \frac{26}{3}$

19. $x = 0.72$

21. $r = -13.26$

27. $V = \frac{k}{P}$

28. $p = \frac{i}{rt}$

31. $B = \frac{2A}{h} - b$ (or $B = \frac{2A-bh}{h}$)

51. 2018

59. $21,000

63. About 8.6 million

65. 301 million

68. 92-octane: 4 Liters

    98-octane: 8 Liters

Ex. #1 Check $(2,-1)$ and $(4,7)$ to see if they are a solution to $y=-2x+3$.

$(2,-1) \rightarrow x=2 \quad -1=-2(2)+3$

$y=-1 \quad -1=-1$ ✓ True

$(4,7) \rightarrow x=4 \quad 7=-2(4)+3$

$y=7 \quad 7\neq -5$ X Not a solution

Defs:

- The **graph** of an equation in two variables is the set of points in the plane whose coordinates are solutions of the equation.
- The **x-intercept** of a graph is the x-coordinate of a point where the graph intersects the x-axis.

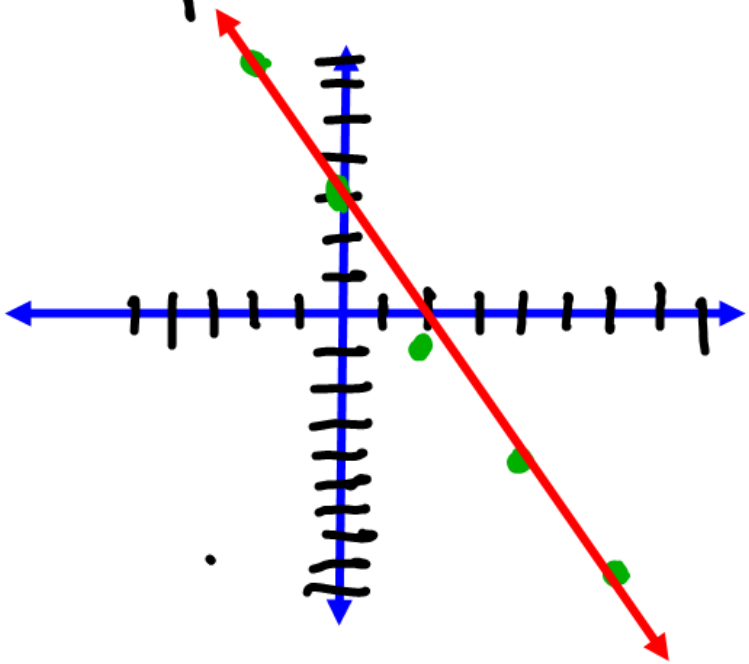
$(x, 0)$

- The **y-intercept** of a graph is the y-coordinate of a point where the graph intersects the y-axis

$(0, y)$

Ex. #2: Make a table and graph for $y = -2x + 3$. What are the x- and y-intercepts?

x	$y = -2x+3$
-2	$-2(-2)+3 = 7$
0	$-2(0)+3 = 3$
2	-1
4	-5
6	-9



x-int: $0 = -2x + 3$

$-3 = -2x$

$x = \frac{3}{2}$

$\left(\frac{3}{2}, 0\right)$

y-int.: $y = -2(0)+3$

$y = 3$

$(0, 3)$

***Note**: Just because we only plotted 5 points, this does not mean they are the only solutions. There are infinite solutions!

Ex #3: Find the x- and y-intercepts of

- $y = x^2 - 2x - 8$.

x-int. (Set $y=0$)

$x^2 - 2x - 8 = 0$

$(x+2)(x-4)=0$

	-8
-1	8
$+2$	-4

$x+2=0$ $\quad$ $x-4=0$

$x=-2$ $\quad$ $x=4$

$(-2,0)$ and $(4,0)$

y-int (Set $x=0$)

$y = 0^2 - 2(0) - 8$

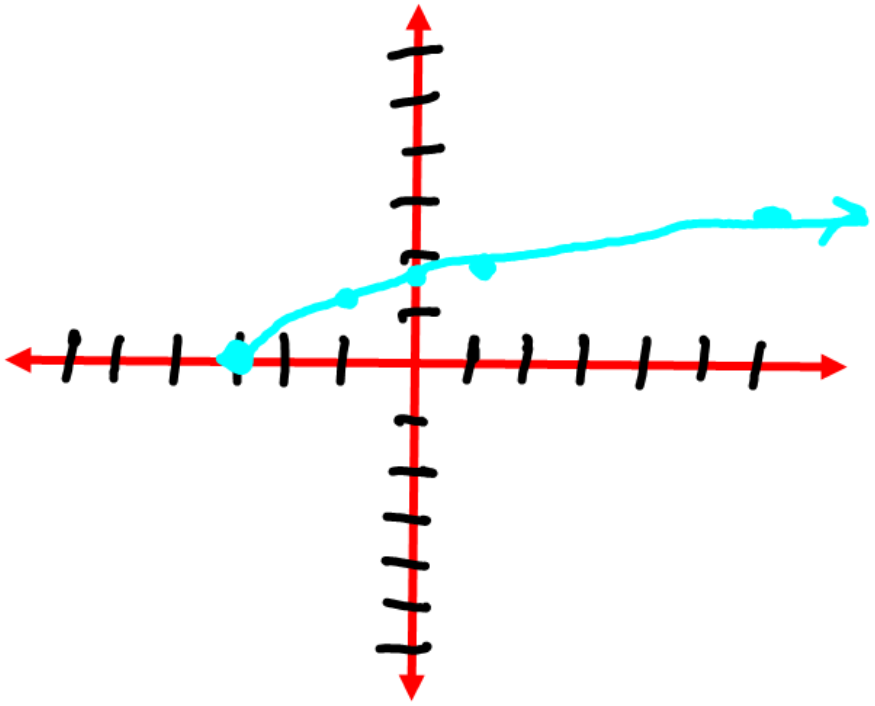
$y = -8$

$(0,-8)$

Note: You can use a table to graph anything.

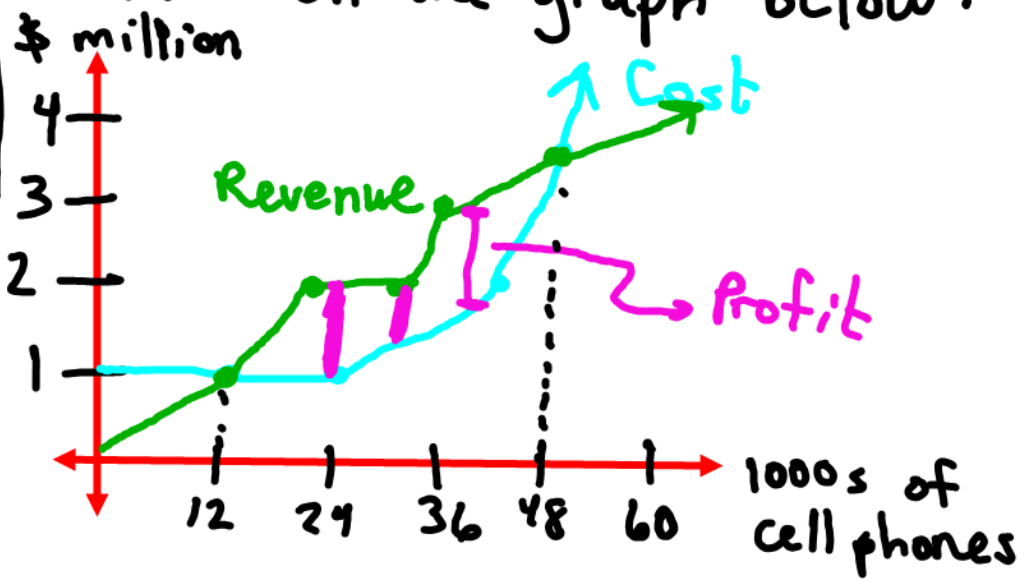
Ex. #4: Sketch $y=\sqrt{x+3}$

x	$y=\sqrt{x+3}$
-4	$\sqrt{-4+3}=\sqrt{-1}$ → Not real
-3	$\sqrt{-3+3}=0$
-1	$\sqrt{2}\approx 1.41$
0	$\sqrt{3}\approx 1.73$
1	2
6	3



Ex #5: Monthly revenue and costs for the Lufkin Cell Phone Corp. are determined by the number of phones produced and sold. This is shown on the graph below:

revenue = $ in
cost = $ out



a.) How many phones to make profit?

Between 12,000 and 48,000

b.) Is it better to make 24,000 or 30,000?

24,000 phones

Ex. #6: Gross sales (in 1,000s) for Zesty Burger for the years 2002-2017 can be modeled by $y = 6.159x^3 - 130.9x^2 + 783.4x - 749$ where x = years since 2000.

a.) What year had the highest gross sales? How much?

max = (4.29, 688.96)

In 2004, gross sales were \$688,960.

b.) Lowest gross sales?

min = (9.87, 153.19)

In 2009, gross sales were \$153,190.

c.) Where does gross sales equal \$500,000?

$x = 6.53 \rightarrow$ 2006

$x = 2.55 \rightarrow$ 2002

d.) What were gross sales in 2011?

$x = 11 \rightarrow$ Gross sales are \$227,130.

Ex. #7: Approximate all real solutions.

*Note: These are our x-intercepts!

a.) $6x^3 - 5x^2 + 3x - 2 = 0$

↓ Put in "y="

To 4 places

$x \approx 0.7555$

b.) $x^5 - 6x + 6 = 0$

$x \approx -1.7521$

(Calc → Zero)