

## (2.2) Solving Equations by Graphing4.notebook

January 16, 2019

**Objectives:** You will be able to find the x and y intercepts of graphs and equations, find solutions graphically, and find the points of intersection between two graphs.

**Recall:** Find the x-and y-intercepts of the graph  $2x + 5y = 3$ .

$$\begin{aligned} X\text{-int: } (1.5, 0) & \quad 2x = 3 \\ & \quad x = 3/2 \\ Y\text{-int: } (0, 0.6) & \quad 5y = 3 \\ & \quad y = 3/5 \end{aligned}$$

Nov 24-6:27 PM

The x-intercept is also called a **zero** of a function

- The point  $(a, 0)$  is and x-intercept of the graph  $y = f(x)$
- The number  $a$  is a zero of the function  $f$ .
- The number  $a$  is a solution of the equation  $f(x) = 0$ .



**Example 1:** Verify that -4 and 3 are zeros of the function  $f(x) = x^2 + x - 12$

$$\begin{aligned} (-4)^2 + (-4) - 12 &= 0 \checkmark \\ 3^2 + 3 - 12 &= 0 \checkmark \end{aligned}$$

Nov 24-6:28 PM

**Example 2:** Use a graphing calculator to find the solution of  $2x^2 - 3x = 2$ .

$$y = 2x^2 - 3x - 2$$

$$x = -1/2, 2$$

Nov 24-6:30 PM

**Example 3:** Use a graphing calculator to find the point(s) of intersection for the graphs of  $x^3 - y = 3$  and  $2x + y = 5$ .

$$\begin{aligned} y &= x^3 - 3 \\ y &= -2x + 5 \\ (1.67, 1.66) \end{aligned}$$

Nov 24-6:31 PM

**Example 4:** text p. 185 #73

$$t(d) = \frac{d}{63} + \frac{280-d}{54}$$

$$\begin{aligned} d &= rt \\ d/r &= t \\ d &: [0, 280] \\ 4 \text{ hrs } 45 \text{ min} \\ 13/4 &= 19/4 \\ 164.5 \end{aligned}$$

Dec 6-1:18 PM

**Example 5:** text p. 185 #74

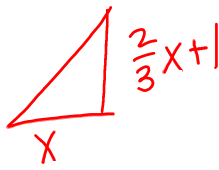
$$a.) C(x) = 25000 + 18.65x$$

$$c.) 9383 \text{ units}$$



Nov 24-6:31 PM

Example 6: text p. 185 #78



$A = \frac{1}{2}bh$   
 $= \frac{1}{2}x\left(\frac{2}{3}x+1\right)$

$A = 200$

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

$x = 23.74 \text{ units}$

Nov 24-6:33 PM

Example 7: text p. 185 #80

$$6050 = -77.6t + 6671$$
$$-671 = -77.6t$$
$$8.65 = t$$

during 1998

Nov 24-6:33 PM



Now you try!!

text p. 185 #76, 77, 79, 81, 83 - 85 & 11- 13 (algebraically)

Nov 30-12:48 PM