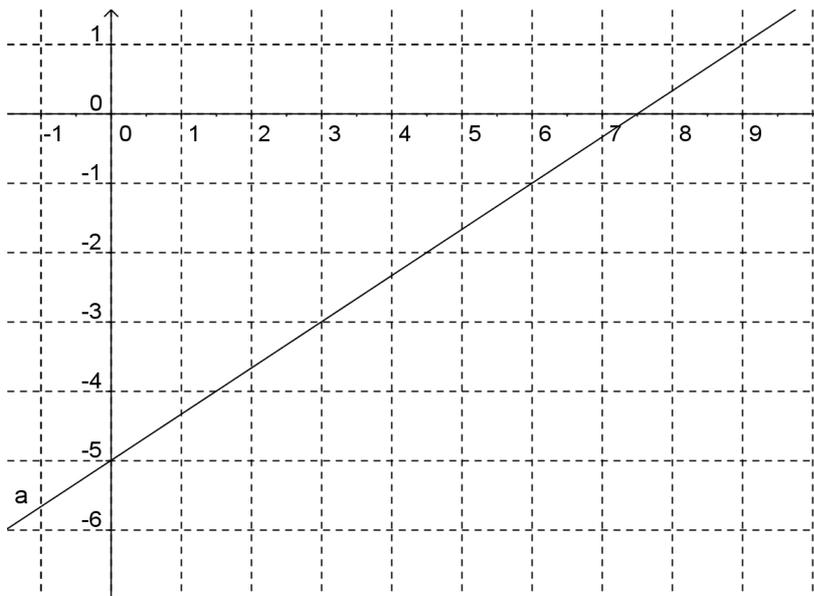


MCR3U: Review of MPM2D

Straight Lines & Parabolas

(see worksheet, available on wiki)

Jan 31-2:27 PM

From your worksheet - a Linear Relation

Jan 31-7:08 PM

Properties:

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

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

y-int: -5 or $y = -5$ or $(0, -5)$ *clearest!*
 x-int: 7.5 or $x = 7.5$ or $(7.5, 0)$

$$\text{slope} = \frac{\text{rise}}{\text{run}}$$

$$= \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{\Delta y}{\Delta x}$$

$$= \frac{1 - (-5)}{9 - 0}$$

$$= \frac{6}{9}$$

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

$P_1(x_1, y_1) = (0, -5)$
 $P_2(x_2, y_2) = (9, 1)$

Jan 31-7:08 PM

Properties:

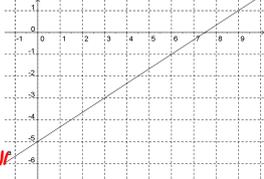
y-intercept:
 $y = -5$, or $(-5, 0)$

x-intercept:
 $x = 7.5$, or $(7.5, 0)$

slope = $\frac{\text{rise}}{\text{run}}$
 $= \frac{\Delta y}{\Delta x}$
 $= \frac{4}{6}$
 $= \frac{2}{3}$

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Equation(s):



$$y = mx + b$$

"slope - intercept form"

$$m = \frac{2}{3} \quad b = -5$$

$$y = \frac{2}{3}x - 5$$

Standard Form: $Ax + By + C = 0$

$\uparrow \quad \uparrow \quad \uparrow$
 A, B, C integers
 $A > 0$

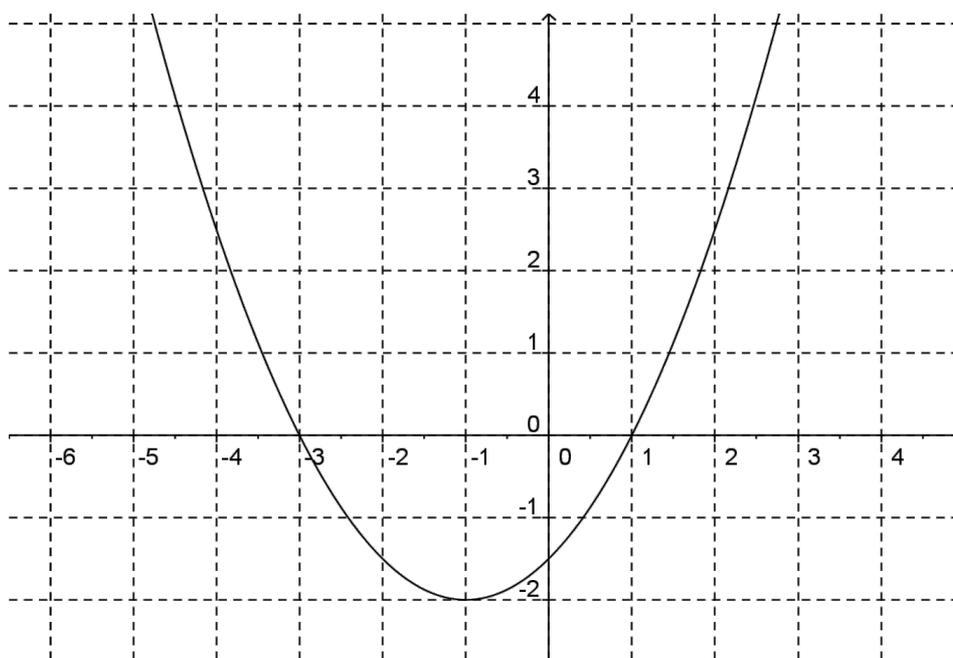
$$3 \times (y) = \left(\frac{2}{3}x - 5\right) \times 3$$

$$3y = 2x - 15$$

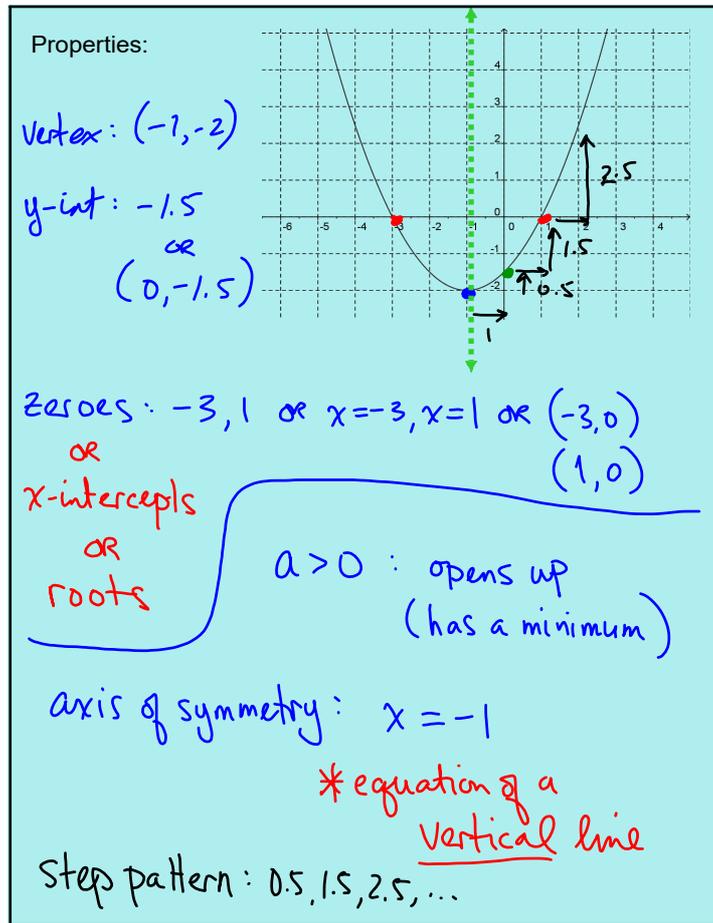
$$0 = 2x - 3y - 15 \quad \checkmark$$

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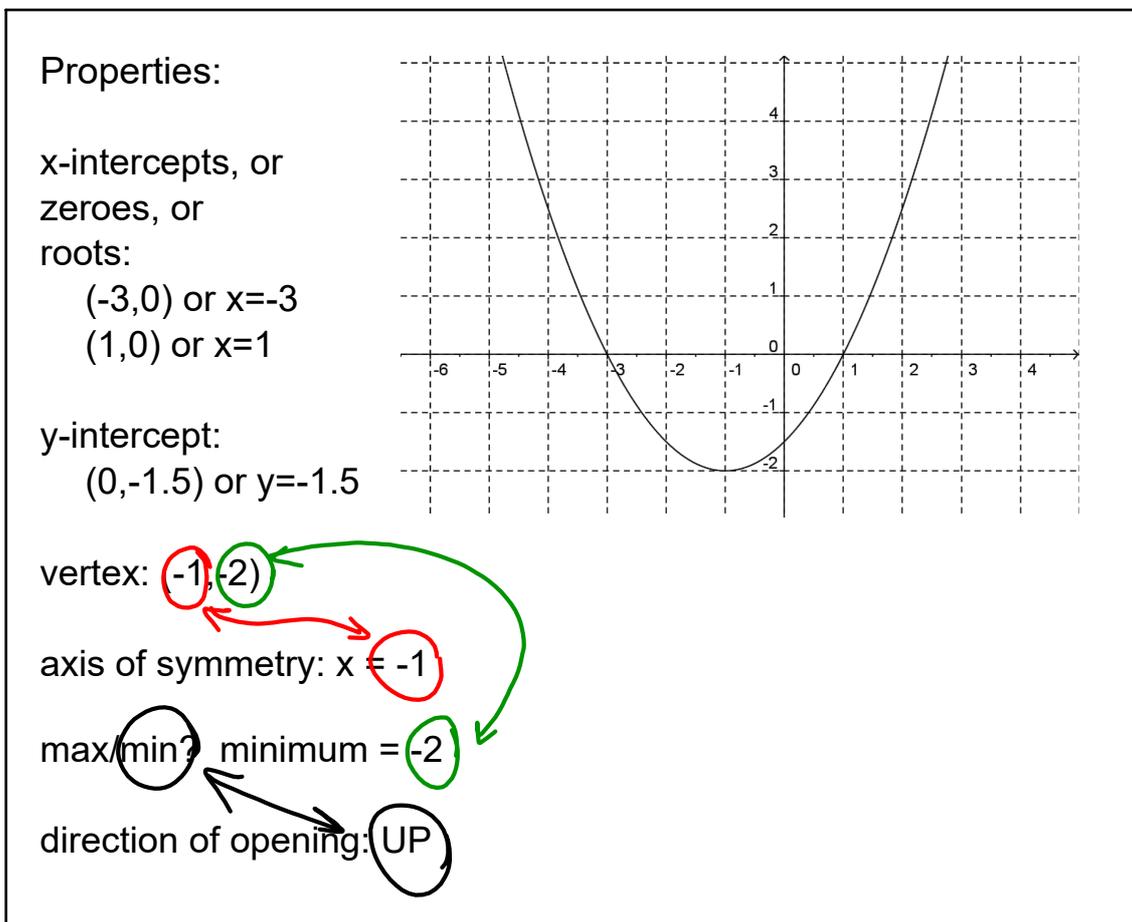
From your worksheet - a Quadratic Relation



Jan 31-7:08 PM



Jan 31-7:08 PM



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Equation(s):

Standard Form:

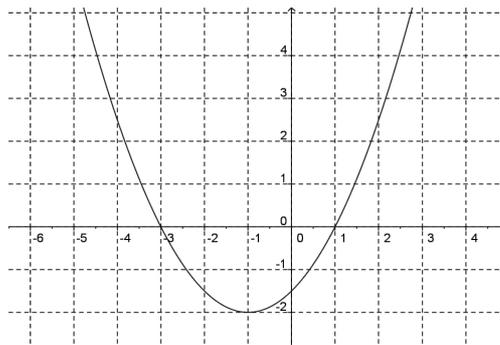
$$y = ax^2 + bx + c$$

Factored Form:

$$y = a(x - s)(x - t)$$

Vertex Form:

$$y = a(x - h)^2 + k$$



Jan 31-7:08 PM

Equation in vertex form:

$$y = a(x - h)^2 + k$$

The vertex is $(-1, -2)$
so $h = -1$ and $k = -2$

$$y = a(x - (-1))^2 + (-2)$$

$$y = a(x + 1)^2 - 2$$

To find a , substitute any point *except* the vertex

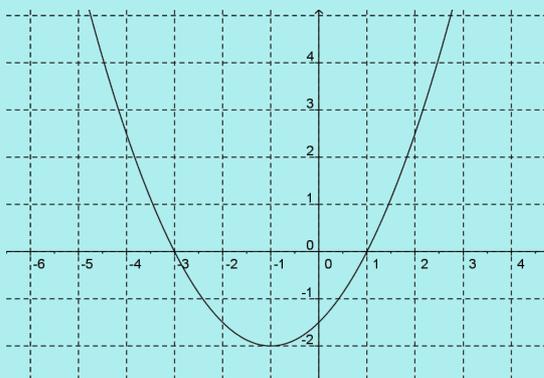
Sub $(1, 0)$: $0 = a(1 + 1)^2 - 2$

$$0 = a(2)^2 - 2$$

$$2 = 4a$$

$$a = \frac{1}{2}$$

The equation in vertex form is $y = \frac{1}{2}(x + 1)^2 - 2$



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Equation in factored form:

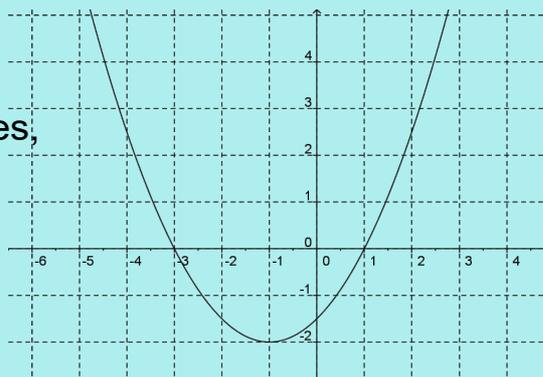
$$y = a(x - s)(x - t)$$

where s and t are the zeroes,
or roots, of the parabola

$$s = -3 \text{ and } t = 1$$

$$y = a(x - (-3))(x - 1)$$

$$y = a(x + 3)(x - 1)$$



To find a , substitute any point *except* one of the zeroes
- the vertex is $(-1, -2)$

$$-2 = a(-1 + 3)(-1 - 1)$$

$$-2 = a(2)(-2)$$

$$-2 = -4a$$

$$a = \frac{1}{2}$$

The equation in factored
form is

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

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Can also obtain standard form by expanding & simplifying
vertex or factored form

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

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

Feb 1-7:11 PM

Assigned Work:

Complete 2 quizzes from MPM2D
(solutions on web page)

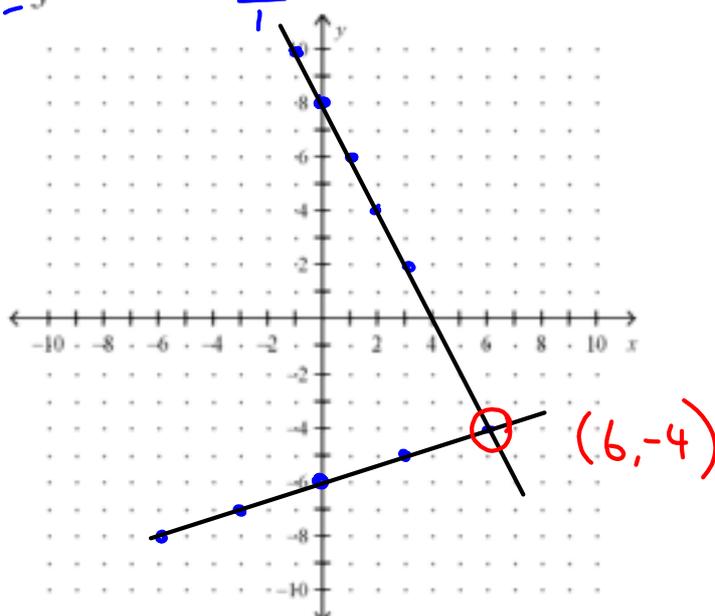
Review course notes for MPM2D
(available via course wiki)

stevesweeney.pbworks.com/MCR3U

Sep 4-7:06 PM

1. Solve the following system of equations by **graphing**.

$y = \frac{1}{3}x - 6$ $y = -2x + 8$ Answer: _____



Feb 5-12:37 PM

2. Use a formal check to verify that the point $(-2, 1)$ is a solution to the system:

$$\begin{array}{l} \text{LS/RS} \quad -3x - 2y = 4 \quad 5y = -3 - 4x \\ \quad \quad \quad \textcircled{1} \quad \quad \quad \textcircled{2} \end{array}$$

$$\begin{aligned} \textcircled{1}: \text{LS} &= -3x - 2y & \text{RS} &= 4 \\ &= -3(-2) - 2(1) \\ &= 6 - 2 \\ &= 4 & \text{LS} &= \text{RS} \checkmark \end{aligned}$$

$$\begin{aligned} \textcircled{2}: \text{LS} &= 5y & \text{RS} &= -3 - 4x \\ &= 5(1) & &= -3 - 4(-2) \\ &= 5 & &= -3 + 8 \\ & & &= 5 \end{aligned}$$

$$\text{LS} = \text{RS} \checkmark$$

$\therefore P(-2, 1)$ is the solution

Feb 5-12:38 PM

3. Solve the following linear system of equations by substitution or elimination.

$$\begin{array}{l} -x + 5y = 3 \quad -4x + 9y = 1 \\ \textcircled{1} \quad \quad \quad \textcircled{2} \end{array}$$

A. Substitution

$$\textcircled{1}: -x + 5y = 3$$

$$5y - 3 = x$$

$$\textcircled{2}: -4x + 9y = 1$$

$$-4(5y - 3) + 9y = 1$$

$$-20y + 12 + 9y = 1$$

$$\frac{-11y}{-11} = \frac{-11}{-11}$$

$$y = 1$$

$$\rightarrow x = 5y - 3$$

$$x = 5(1) - 3$$

$$x = 2$$

\therefore solution is
 $(2, 1)$

$$\textcircled{1} \times 4: -4x + 20y = 12$$

$$\textcircled{2}: -4x + 9y = 1$$

$$\begin{array}{r} \text{subtract:} \\ 11y = 11 \\ y = 1 \end{array}$$

sub $y = 1$ into

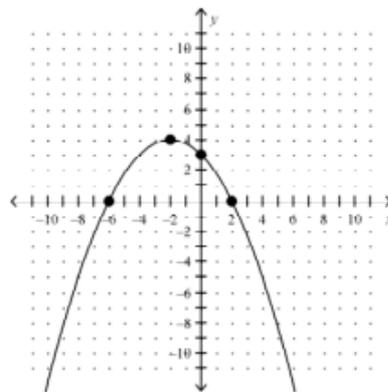
$\textcircled{1}$ or $\textcircled{2}$,

find x

Feb 5-12:38 PM

1. Determine the key features of the provided graph and record them in the table.

Direction of Opening	down
Number of Zeroes	2
Location of Zeroes	-6, 2
y-intercept	(0, 3)
Axis of Symmetry	$x = -2$ *
Max/Min Value	4 (max)
Vertex	(-2, 4)



Feb 5-12:39 PM

2. Expand and simplify $(x+4)(5x-4)$

FoIL

$$\begin{aligned}
 & (x+4)(5x-4) \\
 & = 5x^2 - 4x + 20x - 16 \\
 & = 5x^2 + 16x - 16
 \end{aligned}$$

Feb 5-12:39 PM

3. Fully factor $x^2 - 3x - 18$

$$x^2 - 3x - 18$$

$$= (x - s)(x - t)$$

$$= (x - 6)(x + 3)$$

$$\text{Sum: } -3$$

$$\text{Product: } -18$$

$$I \quad -6, 3$$

$$M \quad -18$$

$$A \quad -3$$

$$N \quad -6, 3$$

Feb 5-12:39 PM

4. Determine the y-intercept, zeroes, equation of the axis of symmetry, and the vertex of:

$$y = (x + 10)(x - 12)$$

$$y = (x - s)(x - t)$$

y-int, set $x = 0$

$$y = (0 + 10)(0 - 12)$$

$$= (10)(-12)$$

$$= -120$$

$$y\text{-int: } (0, -120)$$

zeroes: $x = -10, x = 12$

A of S: halfway between zeroes

$$x = \frac{-10 + 12}{2}$$

$$x = \frac{s + t}{2}$$

$$x = 1 \text{ (equation of a line)}$$

Feb 5-12:40 PM