

Before we begin, are there any questions from last day's work?

263 11

### Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) Find the zeros (x-intercepts) of a quadratic relation by factoring.

**Reminder: SWYK 5.3 Tomorrow (Also on Factoring)**  
**(And includes yesterday's lesson)**

p.262 #11

$$h = -4.9t^2 + v_0 t$$

Main

a)  $h = -4.9t^2 + 19.6t$

b)  $h = -4.9t(t - 4)$

if  $h=0$

$$0 = -4.9t(t - 4)$$

$$\downarrow$$

$$-4.9t = 0$$

$$t = 0$$

$$\downarrow$$

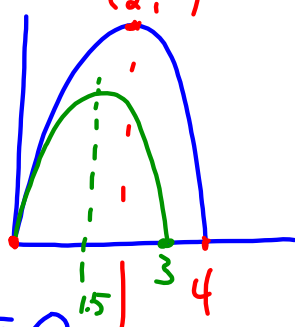
$$t - 4 = 0$$

$$t = 4$$

AGS:

$$t = \frac{0+4}{2}$$

$$= 2$$



$$A \times B = 0$$

$$\downarrow \quad \downarrow$$

$$A = 0 \quad \text{or} \quad B = 0$$

$$v_m = 19.6 \text{ m/s}$$

$$v_s = 14.7 \text{ m/s}$$

Smaller

$$h = -4.9t^2 + 14.7t$$

$$= -4.9t(t - 3)$$

$$\downarrow \quad \downarrow$$

$$t = 0 \quad t = 3$$

if  $t=2$

$$h = -4.9(2)(2-4)$$

$$= -4.9(2)(-2)$$

$$= 19.6$$

if  $t=1.5$

$$h = -4.9(1.5)(1.5-3)$$

$$= -4.9(1.5)(-1.5)$$

$$= 11.025 \text{ m}$$

5.5\_1 The x-Intercepts of a Quadratic Relation  $y=a(x-r)(x-s)$  (Day1\_Spring 2017)-s1 May 1, 2017

MBF 3CI 5.5 The x-Intercepts of a Quadratic Relation  
[ Intercept Form  $y = a(x-r)(x-s)$  ]

Date: May 1/17

Ex. 1 Given the parabola with equation  $y = 2x^2 + 12x + 10$ .

a) convert the equation to intercept form:  $y = a(x-r)(x-s)$  [Hint: factor the equation]

$$\begin{aligned} y &= 2x^2 + 12x + 10 \\ &= 2(x^2 + 6x + 5) \\ &= 2(x+5)(x+1) \end{aligned}$$

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

std. form

b) state the zeros (x-intercepts)

let  $y=0$   $0=2 \cdot A \cdot B$

$$0 = 2(x+5)(x+1)$$

$x+5=0 \rightarrow x=-5$      $x+1=0 \rightarrow x=-1$

c) determine the equation of the axis of symmetry

$$\begin{aligned} x &= \frac{-5 + (-1)}{2} \\ &= \frac{-6}{2} \\ &= -3 \end{aligned}$$

d) determine the vertex

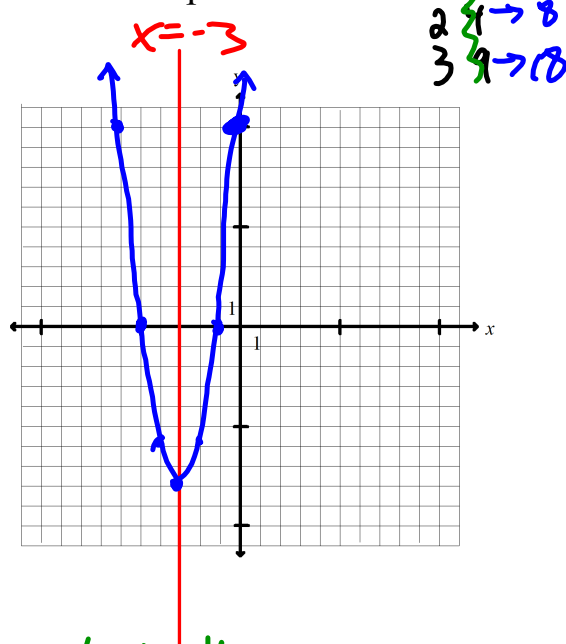
let  $x=-3$

$$\begin{aligned} y &= 2(x+5)(x+1) \\ &= 2(-3+5)(-3+1) \\ &= 2(2)(-2) \\ &= -8 \quad \therefore v(-3, -8) \end{aligned}$$

f) write the equation of the parabola in vertex form

$$\begin{aligned} y &= a(x-h)^2 + k \\ y &= 2(x+3)^2 - 8 \end{aligned}$$

e) sketch the parabola below



\* You can check this by expanding.



## Summary

Given a quadratic relation in vertex form,  $a(x-h)^2 + k$ , the coordinates of the vertex are  $(h,k)$ .

Given a quadratic relation in standard form,  $ax^2 + bx + c$ , the y-intercept is 'c'.

Given a quadratic relation in intercept form,  $a(x-r)(x-s)$ , the 'r' and 's' represent the x-intercepts.

The x-intercepts are also called the **zeros** of the quadratic relation. [  $\therefore y = 0$  at these points ]

**Note that the value of 'a' is the same in all 3 forms.**

**Entertainment: Oral: pp. 271-272 #1, 2  
pp. 271-272 #3**

p. 272

$$3a) y = (x-5)(x+3)$$

$$0 = (x-5)(x+3)$$

$$\begin{array}{ccc} \downarrow & & \downarrow \\ x-5=0 & \text{or} & x+3=0 \end{array}$$

$$x=5$$

$$x=-3$$