

Before we begin, are there any questions from last day's work? Wkst 5.5

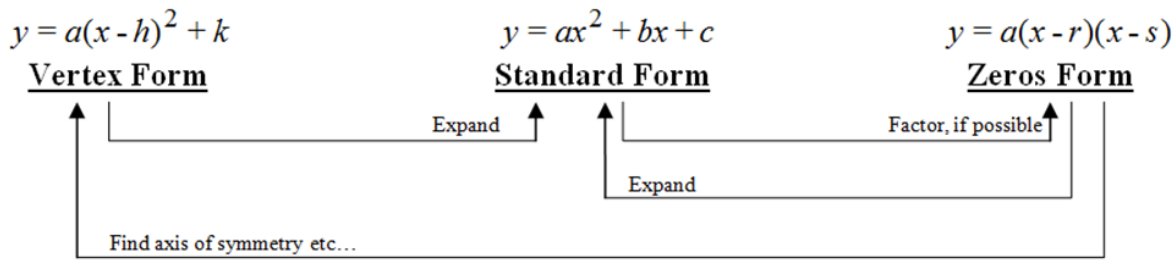
p. 275 Challenge: #12, 13

(Reminder: Unit Summative is Friday, Nov. 25th.)

Today's Learning Goal(s):

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

- a) find the zeros of a quadratic (in standard form), by factoring.
- b) find the vertex, by first finding the axis of symmetry.
[half way between the zeros ~~x~~-intercepts].
- c) solve problems using the above methods.



Ex.1 Given the quadratic relation $y = -2x^2 - 8x + 24$

- a) Does this relation have a maximum or a minimum value?
How do you know? *a is negative so a = -2*
- b) Find the zeroes of the relation.
- c) Determine the x-coordinate of the maximum or minimum point.
- d) What is the equation of the axis of symmetry?
- e) Find the maximum or minimum.
- f) Write the relation in vertex form.
- g) Graph the relation.

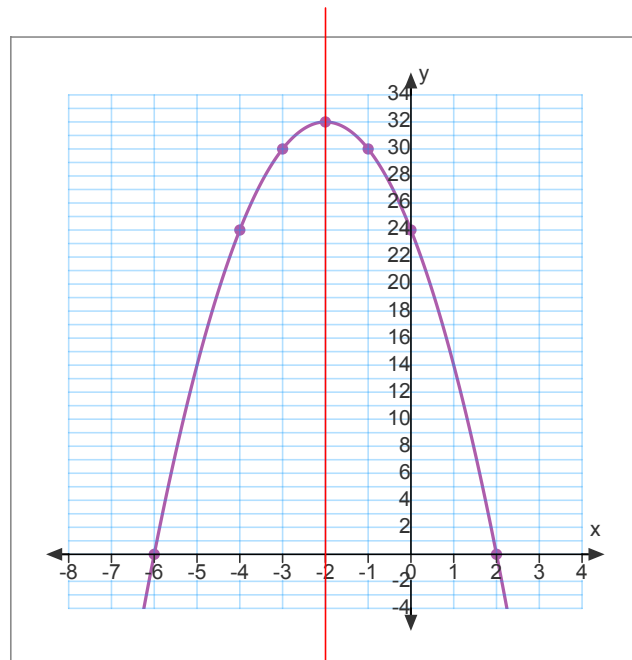
*b) $y = -2x^2 - 8x + 24$
 $= -2(x^2 + 4x - 12)$
 $= -2(x - 2)(x + 6)$
 let $y = 0$, x-int
 $0 = -2(x - 2)(x + 6)$
 $x - 2 = 0$ or $x + 6 = 0$
 $x = 2$ $x = -6$*

c) $x = \frac{-6 + 2}{2}$

d) $x = \frac{-4}{-2}$

*e) $y = -2(x - 2)(x + 6)$
 $= -2(-2 - 2)(-2 + 6)$
 $= -2(-4)(4)$
 $= 32$ ∴ the max is 32*

*f) $y = a(x - h)^2 + k$ ∴ $v(-2, 32)$
 $= -2(x + 2)^2 + 32$*



Ex. 2 Find the equation of the axis of symmetry for each quadratic relation.

a) $y = (x+3)(x+7)$

$$0 = (x+3)(x+7)$$

$$x = -3 \text{ or } x = -7$$

$$x = \frac{-3 + (-7)}{2}$$

$$= \frac{-10}{2}$$

$$x = -5$$

b) $y = -3(x+2)(x-8)$

$$0 = -3(x+2)(x-8)$$

$$x = -2 \text{ or } x = 8$$

$$x = \frac{-2 + 8}{2}$$

$$= \frac{6}{2}$$

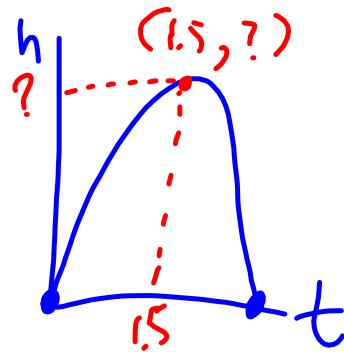
$$= 3$$

Ex. 3 A water balloon is launched upwards. The balloon follows a path modelled by the relation:
 $h = -2.6t^2 + 7.8t$, where h is the balloon's height above the ground, in metres,
 and t is the time, in seconds.

a) When will the balloon hit the ground?

$$\begin{aligned} \text{when } h &= 0 \\ 0 &= -2.6t^2 + 7.8t \\ &= -2.6t(t-3) \\ &\quad \downarrow \qquad \downarrow \\ &t=0 \text{ or } t=3 \end{aligned}$$

the balloon hits the ground at 3 sec.



b) What is the balloon's maximum height?

$$\begin{aligned} &\text{occurs when } t = 1.5 \text{ sec} \\ t &= \frac{0+3}{2} \\ &= \frac{3}{2} \\ &= 1.5 \\ h &= -2.6t(t-3) \\ &= -2.6(1.5)(1.5-3) \\ &= -2.6(1.5)(-1.5) \\ &= 5.85 \end{aligned}$$

the balloon's maximum height is 5.85 m

Entertainment: pp. 281-284 #1, 2ad, 3abcd, 4, 5abcde, 13, 14ab