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

Read p.267 Example 2, Method 1: Complete the Square

pp. 270-272 #4c, 5, 6a, 8abce, 17ab, 19

***Enrichment*:** pp. 272-273 #17d, 27

Today's Learning Goal(s):

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

a) find the vertex of a quadratic relation
when it is presented in standard form.

b) solve a word problem involving
finding the maximum or minimum value of a quadratic function.

p.272 #17

a) $y = 1.5x^2 + 6x - 7$

$= 1.5(x^2 + 4x) - 7$

$= 1.5(x^2 + 4x + 4 - 4) - 7$

$= 1.5(x+2)^2 - 6 - 7$

$= 1.5(x+2)^2 - 13$

$\therefore V(-2, -13)$

$\therefore$ the min. point is $(-2, -13)$

b) $y = -0.1x^2 - 2x + 1$

$= -0.1(x^2 + 20x) + 1$

$= -0.1(x^2 + 20x + 100 - 100) + 1$

$= -0.1(x+10)^2 + 10 + 1$

$= -0.1(x+10)^2 + 11$

$\therefore$ the max point is $(-10, 11)$.

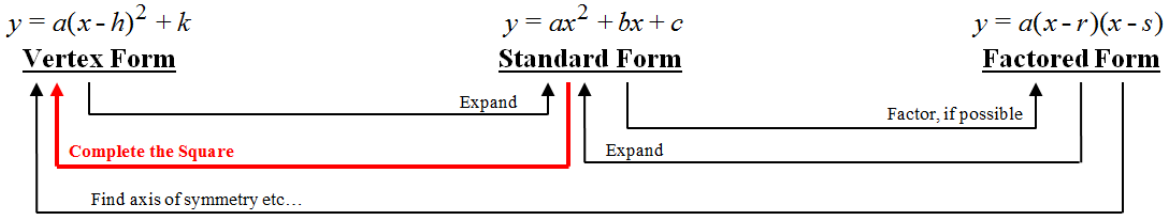
#19 a) $x^2 + 8x + c = (x+h)^2$

$x^2 + 8x + 16 = (x+4)^2$

b) $x^2 + bx + 36 = (x+h)^2$

$x^2 + 12x + 36 = (x+6)^2$

MPM 2DI 6.1 Maxima and Minima-Completing the Square (Day2) Date: Dec. 1/16



Warm-up: Find the vertex by completing the square.

a) $y = -x^2 + 12x - 40$

$= -(x^2 - 12x) - 40$

$= -(x^2 - 12x + 36 - 36) - 40$

$= -(x-6)^2 + 36 - 40$

$= -(x-6)^2 - 4$

$\therefore V(6, -4)$

b) $y = 2x^2 + 16x + 29$

$= 2(x^2 + 8x) + 29$

$= 2(x^2 + 8x + 16 - 16) + 29$

$= 2(x+4)^2 - 32 + 29$

$= 2(x+4)^2 - 3$

$\therefore V(-4, -3)$

Ex. 1 A ball is slingshot from the roof of the school.
It's height, h, in metres is given by $h = -4.9t^2 + 29.4t + 12$, where t, is the time in seconds.
a) What is the height of the school?
b) What is the maximum height reached by the ball and when does it reach it?

a) Let $t = 0$

$h = -4.9(0)^2 + 29.4(0) + 12$

$= 12$

$\therefore$ the height of the school is 12 m.

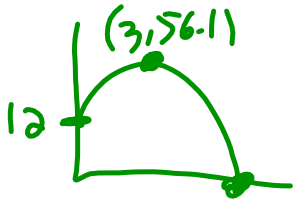
b) $h = -4.9t^2 + 29.4t + 12$

$= -4.9(t^2 - 6t) + 12$

$= -4.9(t^2 - 6t + 9 - 9) + 12$

$= -4.9(t-3)^2 + 44.1 + 12$

$= -4.9(t-3)^2 + 56.1$



V(3,56.1)

the maximum height reached by the ball is 56.1 m,
and it reaches it at 3 sec.

Today's practice: Worksheet #1 to 6
***Enrichment*:** #7 to 10

Worksheet #1

Decimal

$h = -2x^2 + 6x + 5$

$= -2(x^2 - 3x) + 5$

$= -2\left(x^2 - 3x + \left(\frac{3}{2}\right)^2 - \left(\frac{3}{2}\right)^2\right) + 5$

$= -2\left(x^2 - 3x + \frac{9}{4} - \frac{9}{4}\right) + 5$

$= -2\left(x - \frac{3}{2}\right)^2 + \frac{9}{2} + 5$

$= -2\left(x - \frac{3}{2}\right)^2 + \frac{19}{2}$

$\frac{9}{2} + \frac{10}{2}$

Fraction

$h = -2x^2 + 6x + 5$

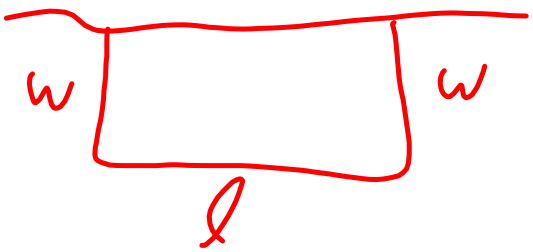
$= -2(x^2 - 3x) + 5$

$= -2(x^2 - 3x + 2.25 - 2.25) + 5$

$= -2(x - 1.5)^2 + 4.5 + 5$

$= -2(x - 1.5)^2 + 9.5$

#6



100m

$100 = 2w + l$

$A = lw$

$=$