# DAY 2 – Converting Vertex Form to Standard Form

1. Write each equation in standard form.

a. $y=(x+2)^2+3$

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

$y=x^2+4x+7$

b. $y=2(x-1)^2$

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

$y=2x^2-4x+2$

c. $y=-(x+4)^2-1$

$y=-(x^2+8x+16)-1$

$y=-x^2-8x-16-1$

$y=-x^2-8x-17$

2. Determine whether the equations in each set are equivalent.

a. $y=(x+2)^2$ $=x^2+4x+4$

$y=x^2+4$

NO

b. $y=-(x+1)^2+3$

$y=-x^2-2x-4$

$y=-(x^2+2x+1)+3$

$y=-x^2-2x-1+3$

$y=-x^2-2x+2$

NO

c. $y=3(x-2)^2-4$

$y=3x^2-12x+8$

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

$y=3x^2-12x+12-4$

$y=3x^2-12x+8$

YES

3. a. Which relation has the same graph as $y=2x^2-12x+19$?

i. $y=2(x-2)^2+17$

ii. $y=2(x-2)^2+11$

iii. $y=2(x-3)^2+1$

Justify your choice.

i) $2(-2)^2+17$ $=25$ X

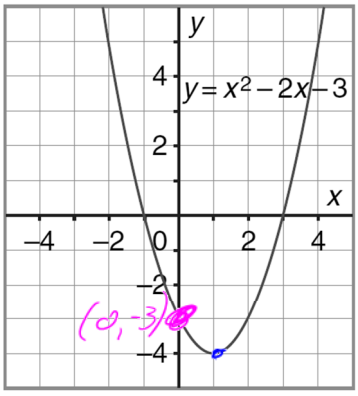
ii) $2(-2)^2+11$ $=19$ ✓

b. Determine the coordinates of the vertex for the parabola $y=2x^2-12x+19$. (2, 11)

Explain how you determined these coordinates.

Looked at ii) above.

4. The graph of the parabola $y = x^2 - 2x - 3$ is shown.




   a. What are the coordinates of the vertex? (1, −4)

   b. Write the equation in vertex form.

$y = a(x-1)^2 - 4$

$-3 = a(0-1)^2 - 4$ (+4, +4)

$1 = 1a$, or $a = 1$ $\therefore y = (x-1)^2 - 4$

   c. Check that the equation in part b is correct by converting it to standard form.

$y = (x^2 - 2x + 1) - 4$

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

5. $h = -5(t - 0.6)^2 + 11.8$ represents height, in m, of a diver above the water, where t is time, in sec, since the person left the 10 m high platform.

   a. What is the maximum height?

$k = 11.8$, $\therefore$ max height is 11.8 metres

   b. How long after the diver left the platform does she reach her maximum height?

$h = 0.6$, $\therefore$ it took 0.6 seconds to reach the max height.

   c. What is the y-intercept (h-int) and what does it represent?

$t = 0$ (or $x = 0$)

$h = -5(0 - 0.6)^2 + 11.8$

$h = -5(0.36) + 11.8$

$h = -1.8 + 11.8$

$h = 10$

$\therefore$ the platform is 10 m high

it was in the question too...