

Unit: Transformations of Quadratic Topic: Completing the Square ax^2+bx+c form

✚ *homework check:* FM 11 p. 163 # 1 , 2

✚ *note:* Completing the Square ax^2+bx+c form

Completing the square when the value of 'a' is not one involves a few more steps. We must be sure to common factor the value of 'a' even if it is not nice. For example,

$$a) y = 2x^2 + 8x - 1$$

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

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

*half the middle term and square it

- don't forget to do the opposite outside the brackets

$$\left(\frac{4}{2}\right)^2$$

$$y = 2(x^2 + 4x + 4) - 8 - 1$$

$$y = 2(x + 2)^2 - 9$$

vertex(-2, -9) with vertical stretch of 2

$$b) y = -3x^2 + 18x - 15$$

$$y = (-3x^2 + 18x) - 15$$

$$y = -3(x^2 - 6x) - 15$$

*half the middle term and square it

- don't forget to do the opposite outside the brackets

$$\left(\frac{-6}{2}\right)^2$$

$$y = -3(x^2 - 6x + 9) + 27 - 15$$

$$y = -3(x - 3)^2 + 12$$

vertex(3,12) with vertical stretch of 3 and a vertical reflection

$$c) y = 2x^2 - 6x + 3$$

$$y = (2x^2 - 6x) + 3$$

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

*half the middle term and square it

- don't forget to do the opposite outside the brackets

$$\left(\frac{-3}{2}\right)^2$$

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

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

vertex $\left(\frac{3}{2}, -\frac{3}{2}\right)$ with vertical stretch of 2

▣ **homework assignment: FM 11 p. 163 # 3, 4**