

p.238 #23 quadratic model
with 3 points-

$$(0, -7)$$

$$(7, -14)$$

$$(-3, -19)$$

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

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

$$y = -\frac{1}{2}x^2 + \frac{5}{2}x - 7$$

$$a = -\frac{1}{2}$$

$$b = \frac{5}{2}$$

$$c = -7$$

$$\begin{array}{l} (0, -7) \\ (7, -14) \\ (-3, -19) \end{array} \begin{array}{l} x^2 \\ x \\ 1 \\ y \end{array} \left[\begin{array}{cccc} 0 & 0 & 1 & -7 \\ 49 & 7 & 1 & -14 \\ 9 & -3 & 1 & -19 \end{array} \right]$$

$$\begin{array}{|ccc|} \hline \del{49} & \del{7} & \del{1} & \del{-14} \\ \del{9} & \del{-3} & \del{1} & \del{-19} \\ \hline \end{array}$$

rref([A])

$$\begin{array}{|ccc|} \hline 1 & 0 & 0 & -0.5 \\ 0 & 1 & 0 & 2.5 \\ 0 & 0 & 1 & -7 \\ \hline \end{array}$$

got it!

$$a = -\frac{1}{2}$$

$$b = \frac{5}{2}$$

$$c = -7$$

Factoring "nuance" - standard form starts with "-"
($a < 0$)

Ex: #27 p. 239

factor: $-4x^2 + 14x - 6$

"factor out negative" and GCF

$$-2(2x^2 - 7x + 3)$$

factor

$$2x^2 - 6x - 1x + 3$$

$$\underline{2x}(x-3) - \underline{1}(x-3)$$

$$-2(x-3)(2x-1)$$

$m \cdot n = 6$
 $m + n = -7$
 $-1, -6$

Formula Card? Factoring "patterns"

$$a^2 - b^2 \rightarrow (a+b)(a-b)$$

$$25x^2 - 16 \rightarrow (5x+4)(5x-4)$$

$$a^2 \pm 2ab + b^2 \rightarrow (a \pm b)^2$$

$$4x^2 - 12x + 9 \rightarrow (2x-3)^2$$

$$a = 2x$$

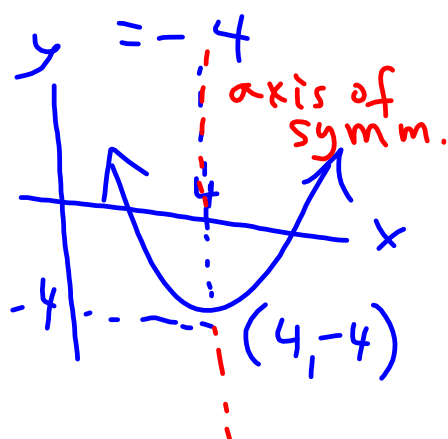
$$b = 3$$

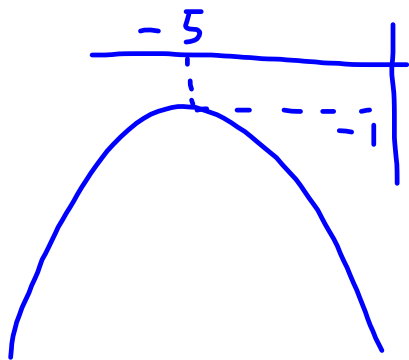
$$2ab = 2 \cdot 2x \cdot 3 = 12x$$

Standard Form \rightarrow
 vertex
 max/min
 axis of symm
 stretch/shrink factor
 Domain
 Range
 Reflect?

$$x^2 - 8x + 12 \rightarrow$$

$a=1$ $b=-8$ $c=12$ vertex $(4, -4)$
 $h = -\frac{b}{2a} = -\frac{-8}{2} = 4$ max/min -4
 axis of symm $x=4$
 $k = 4^2 - 8(4) + 12 = 16 - 32 + 12 = -4$ ~~stretch/shrink factor $a=1$~~
 Domain \mathbb{R}
 Range $y \geq -4$
 reflect? no





Graph
vertex $(-5, -1)$
max/min -1
axis of symm $x = -5$
stretch/shrink factor?
Domain \mathbb{R}
Range $y \leq -1$
Reflect? yes