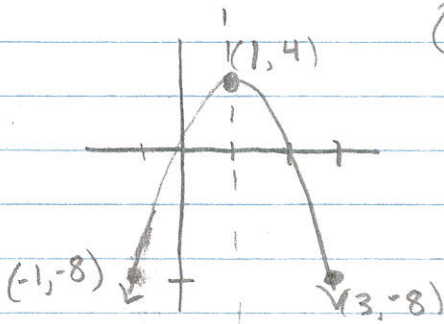


3.1 - Day 2 NOTES AND p.164 #41

Ex. 1 p.165 #68

① Find the 3rd point on the parabola by reflecting $(-1, -8)$ across the Axis of Symmetry. $\rightarrow (3, -8)$



② Substitute the 3 pts (separately) into $F(x) = ax^2 + bx + c$ to get 3 equations.

$$-8 = a(-1)^2 + b(-1) + c$$

$$-8 = a - b + c$$

$$4 = a(1) + b(1) + c$$

$$4 = a + b + c$$

③ Write as a system of equations and put into matrix A + B in your calculator.

$$-8 = a - b + c$$

$$4 = a + b + c$$

$$-8 = 9a + 3b + c$$



$$-8 = a(3)^2 + b(3) + c$$

$$-8 = 9a + 3b + c$$

$$\begin{bmatrix} -8 \\ 4 \\ -8 \end{bmatrix} = \begin{bmatrix} 1 & -1 & 1 \\ 1 & 1 & 1 \\ 9 & 3 & 1 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \end{bmatrix}$$

④ Do $A^{-1} \cdot B$ on the homescreen of your calculator

$$X = A^{-1}B$$

$$A^{-1}B = \begin{bmatrix} -3 \\ 6 \\ 1 \end{bmatrix} \begin{matrix} \rightarrow a \\ \rightarrow b \\ \rightarrow c \end{matrix}$$

Ex. 2 (p.165 #72)

① Find the coordinates of the vertex

$$\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right) \right)$$

$$\left(\frac{-1900}{2(-1/2)}, f\left(\frac{-1900}{2(-1/2)}\right) \right)$$

$(1900, 1,805,000) = \text{vertex}$

$$p = \$1900$$

$$\text{max revenue} = 1,805,000$$

p.164 #41 $f(x) = x^2 + 2x - 8$ (opens \downarrow)

vertex $(-1, -9)$

$$f(x) = (x+4)(x-2)$$

AOS $\rightarrow x = -1$

Decreasing $(-\infty, -1)$

y-int $(0, -8)$

increasing $(-1, \infty)$

x-int $(-4, 0) + (2, 0)$

Domain: $(-\infty, \infty)$

Range: $[-9, \infty)$