

Warm-up

(2.1)/2.2 Quiz next Monday

Find the equation of the parabola given:

a) vertex  $(-3, -2)$  ←  
passes through  $(\frac{1}{2}, 2)$ b) passes through  
 $(-5, 4), (-1, 6), (1, 4)$ 

$$f(x) = a(x-h)^2 + k$$

$$f(x) = a(x+3)^2 - 2$$

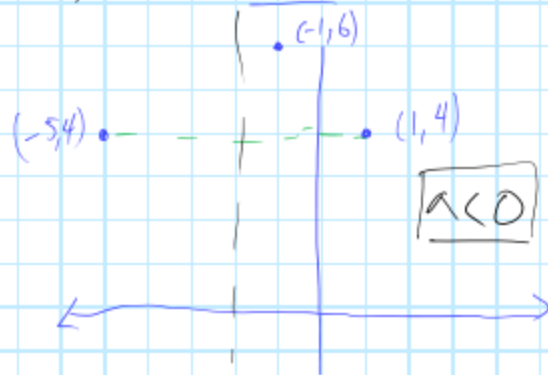
$$f\left(\frac{1}{2}\right) = a\left(\frac{1}{2}+3\right)^2 - 2 = 2$$

$$a\left(\frac{7}{2}\right)^2 = 4$$

$$\frac{4}{49} \times \frac{49}{4} a = 4 \times \frac{4}{49}$$

$$a = \frac{16}{49}$$

$$f(x) = \frac{16}{49}(x+3)^2 - 2$$



$$\begin{aligned} \text{Middle of } (-5, 4), (1, 4) &= \frac{-5+1}{2} \\ &= \frac{-4}{2} \end{aligned}$$

$$h = -2$$

$$f(x) = a(x+2)^2 + k$$

Mirror point  $(1, 4)$  $(-5, 4)$ 

$$f(1) = a(1+2)^2 + k = 4$$

$$f(-5) = a(-5+2)^2 + k = 4$$

$$9a + k = 4$$

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$$\text{(i) } k = 4 - 9a$$

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Not mirror point  $(-1, 6)$ 

$$f(-1) = a(-1+2)^2 + k = 6$$

$$a + k = 6$$

Not minor point  $(-1, 6)$

$$f(-1) = a(-1+2)^2 + k = 6$$

$$| a + k = 6$$

$$\textcircled{\text{ii}} \quad k = 6 - a$$

$$\textcircled{\text{i}} = \textcircled{\text{ii}} \Rightarrow \cancel{4} - \cancel{a} = \cancel{6} - a$$

$$-2 = 8a$$

$$\underline{-\frac{1}{4} = a}$$

$$\textcircled{\text{ii}} \Rightarrow k = 6 - \left(-\frac{1}{4}\right)$$

$$k = \frac{24}{4} + \frac{1}{4}$$

$$k = \frac{25}{4}$$

$$f(x) = -\frac{1}{4}(x+2)^2 + \frac{25}{4}$$