

$f(x) = (x+4)(x-6)$ Factored to standard

$$= x^2 - \underbrace{6x + 4x} - 24$$

$$= x^2 - 2x - 24$$

$$\begin{array}{r} x+4 \\ x \begin{array}{|c|c|} \hline x^2 & 4x \\ \hline -6x & -24 \\ \hline \end{array} \\ -6 \end{array} = x^2 + 4x - 6x - 24 = x^2 - 2x - 24$$

$f(x) = 1(x+4)(x-6)$ Factored to vertex

x-intercepts: $-4, +6$

$$\frac{-4+6}{2} = \frac{2}{2} = 1 \quad h \quad (\text{x-value of vertex})$$

to find k, plug in h for x in original equation:

$$f(1) = (1+4)(1-6) = (5)(-5) = -25 \quad k \quad (\text{y-value of vertex})$$

write in vertex form: $f(x) = 1(x-1)^2 - 25$

vertex: $(1, -25)$

$f(x) = 1(x-1)^2 - 25$ vertex to standard

$$f(x) = 1(x-1)(x-1) - 25$$

$$= x^2 - \underbrace{1x} - \underbrace{1x} + 1 - 25$$

$$= x^2 - 2x - 24$$

$f(x) = (x-1)^2 - 25$ vertex to factored

$$x=6 \quad -6 \quad -6 \quad (x-6)=0$$

$$0 = (x-1)^2 - 25$$
$$\begin{array}{ccc} +25 & & +25 \end{array}$$

$$\rightarrow x-1 = \pm 5$$
$$\begin{array}{ccc} +1 & +1 & \end{array}$$

$$x = 1 \pm 5$$

$$1+5 = 6 = x$$

x-intercepts

$$1-5 = -4 = x$$

$$+4 \quad +4$$

$$(x+4)=0$$

$$\pm \sqrt{25} = \sqrt{(x-1)^2}$$

$$\pm 5 = x-1$$

$$f(x) = (x-6)(x+4)$$

$$f(x) = 1x^2 - 2x - 24 \quad \text{standard to factored}$$

factors of $a \cdot c = -24$ | sum to $b = -2$

$-1 \cdot 24$	$-1 + 24 = 23$
$-2 \cdot 12$	$-2 + 12 = 10$
$-3 \cdot 8$	$-3 + 8 = 5$
$-4 \cdot 6$	$-4 + 6 = 2$
$-6 \cdot 4$	$-6 + 4 = -2$
$-8 \cdot 3$	$-8 + 3 = -5$
$-12 \cdot 2$	$-12 + 2 = -10$
$-24 \cdot 1$	$-24 + 1 = -23$

x-intercepts:
+6, -4

$$f(x) = (x - 6)(x + 4)$$

$$f(x) = x^2 - 2x - 24 \quad \text{standard to vertex}$$

$$f(x) = x^2 - 2x + \frac{1}{1} - 24 - \frac{1}{1}$$

$$\left(\frac{b}{2}\right)^2 = \left(\frac{-2}{2}\right)^2 = (-1)^2 = 1$$

$$f(x) = (x - 1)^2 - 25 \quad \text{vertex: } (1, -25)$$

$$x^2 - 2x + 1$$

$a \cdot c = 1$	$b = -2$
$1 \cdot 1$	$1 + 1 = 2$
$-1 \cdot -1$	$-1 + -1 = -2$

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


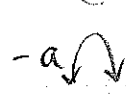
benefits:

standard form: $c = y$ -intercept

factored form: x -intercepts

vertex form:

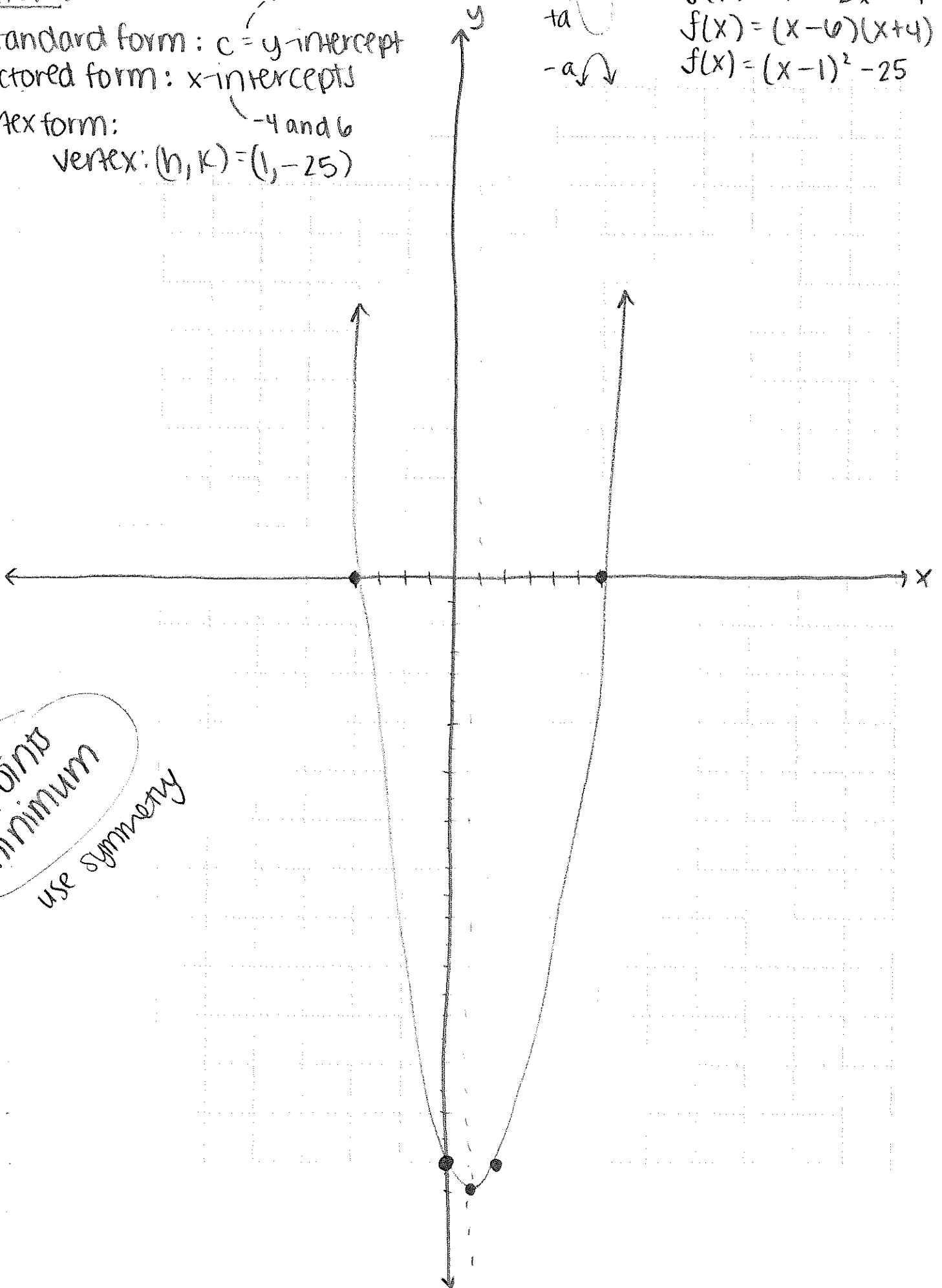
vertex: $(h, k) = (1, -25)$

$+a$ 
 $-a$ 

$$f(x) = x^2 - 2x - 24$$

$$f(x) = (x - 6)(x + 4)$$

$$f(x) = (x - 1)^2 - 25$$



5 points
minimum
use symmetry