

WH# 1bd, 2a, 3ce, 4, 8

1b.) $(0, 12)$ $y = a(x-2)^2 \therefore 12 = a(-2)^2$

$\therefore 12 = 4a$

$\therefore a = 3$

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

1d.) $(0,3)$, x -intercepts $-1, 3 \therefore y = a(x+1)(x-3)$

$$3 = a(1)(-3)$$

$$3 = -3a \therefore a = -1$$

$$y = -(x+1)(x-3)$$

2a.) $(0,12)$ x -intercepts $2, 4 \therefore y = a(x-2)(x-4)$

$$12 = a(-2)(-4)$$

$$12 = \frac{8a}{8} \quad a = \frac{3}{2}$$

$$y = \frac{3}{2}(x-2)(x-4)$$

3c.) vertex $(3,0)$, $(-2, -25) \therefore y = a(x-3)^2$

$$-25 = a(-2-3)^2$$

$$-25 = a(-5)^2$$

$$-25 = 25a$$

$$\therefore a = -1$$

$$y = -(x-3)^2 \Rightarrow y = -(x-3)(x-3)$$

$$\Rightarrow y = (-x+3)(x-3)$$

$$= -x^2 + 3x + 3x - 9$$

$$y = -x^2 + 6x - 9$$

3e.) $(3,0)$, passes through $(5,12)$, axis of sym $x=2$
 \therefore other x -int is $(1,0)$

$$y = a(x-1)(x-3) \therefore 12 = a(5-1)(5-3)$$

$$12 = a(4)(2)$$

$$12 = \frac{8a}{8} \quad a = \frac{3}{2}$$

$$y = \frac{3}{2}(x-1)(x-3)$$

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

$$\Rightarrow y = \frac{3}{2}x^2 - \frac{12}{2}x + \frac{9}{2} \Rightarrow y = \frac{3}{2}x^2 - 6x + \frac{9}{2}$$

4.) a.) c is the y -int so $c=2$

b.) $1 = a(1)^2 + b(1) + 2 \Rightarrow a + b + 2 = 1 \Rightarrow a + b = -1$
 $6 = a(2)^2 + b(2) + 2 \Rightarrow 4a + 2b + 2 = 6 \Rightarrow 4a + 2b = 4$

c.) $4a + 2b = 4 \Rightarrow 4a + 2b = 4$ $3 + b = -1$
 $a + b = -1 \quad (-2) \quad + \quad -2a - 2b = 2$ $b = -4$

$2a = 6$

$\therefore a = 3$

$\therefore y = 3x^2 - 4x + 2$

8.) vertex = $(3, 7)$ passes through $(5, 3)$

a.) Since a quadratic is symmetric, another point would be $(1, 3)$ because if you go the same distance in the x direction, the y -values will be the same.

$\therefore a(3)^2 + b(3) + c = 7 \Rightarrow 9a + 3b + c = 7$

$a(5)^2 + b(5) + c = 3 \Rightarrow 25a + 5b + c = 3$

$a(1)^2 + b(1) + c = 3 \Rightarrow a + b + c = 3$

$9a + 3b + c = 7$	$25a + 5b + c = 3$	$8a + 2b = 4 \quad (-2)$
$+ -a - b - c = -3$	$+ -a - b - c = -3$	$24a + 4b = 0$
$8a + 2b = 4$	$24a + 4b = 0$	$-16a - 4b = -8$
$8(-1) + 2b = 4$		$8a = -8$
$-8 + 2b = 4$	$-1 + 6 + c = 3$	$\therefore a = -1$
$2b = 12$	$5 + c = 3$	
$\therefore b = 6$	$\therefore c = -2$	

$y = -x^2 + 6x - 2$

(Also, you could use the fact that

$\frac{-b}{2a} = 3 \Rightarrow -b = 6a \Rightarrow 0 = 6a + b$ as an equation)