

Exercise 1D

1) b. vertex: $(2, 0)$

y-int: $(0, 8)$

$$y = a(x-2)^2 + 0$$

$$8 = a(0-2)^2$$

$$8 = 4a$$

$$2 = a \rightarrow y = 2(x-2)^2$$

c. roots: $(1, 0)$ & $(3, 0)$

y-int: $(0, 3)$

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

$$3 = a(0-1)(0-3)$$

$$3 = 3a$$

$$1 = a \rightarrow y = (x-1)(x-3)$$

2) a. roots: $(2, 0)$ & $(4, 0)$

y-int: $(0, 12)$

$$y = a(x-2)(x-4)$$

$$12 = a(0-2)(0-4)$$

$$12 = 8a$$

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

3) b. roots: $(2, 0)$ & $(-\frac{1}{2}, 0)$

point: $(3, -14)$

$$y = a(x-2)(2x+1)$$

$$-14 = a(3-2)(2(3)+1)$$

$$-14 = 7a$$

$$-2 = a \rightarrow y = -2(x-2)(2x+1)$$

c. vertex: $(3, 0)$

point: $(-2, -25)$

$$y = a(x-3)^2 + 0$$

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

$$-25 = 25a$$

$$-1 = a \rightarrow y = -(x-3)^2$$

e. root: $(3, 0)$ & $(1, 0)$

point: $(5, 12)$

a.o.s: $x=2$

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

$$12 = a(5-3)(5-1)$$

$$12 = 8a$$

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

4. a. vertex: $(2, 4)$

y-int/point: $(0, 0)$

$$y = a(x-2)^2 + 4$$

$$0 = a(0-2)^2 + 4$$

$$-4 = 4a$$

$$-1 = a \rightarrow \boxed{y = -1(x-2)^2 + 4}$$

c) vertex: $(3, 8)$

root/point: $(1, 0)$

$$y = a(x-3)^2 + 8$$

$$0 = a(1-3)^2 + 8$$

$$-8 = 4a$$

$$-2 = a \rightarrow \boxed{y = -2(x-3)^2 + 8}$$

-OR- vertex: $(3, 8)$

roots: $(1, 0)$ & $(5, 0)$

$$y = a(x-1)(x-5)$$

$$8 = a(3-1)(3-5)$$

$$8 = -4a$$

$$-2 = a \rightarrow \boxed{y = -2(x-1)(x-5)}$$

f. vertex: $(\frac{1}{2}, \frac{-3}{2})$

point: $(\frac{3}{2}, \frac{1}{2})$

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

$$\frac{1}{2} = a(\frac{3}{2} - \frac{1}{2})^2 - \frac{3}{2}$$

$$2 = a \rightarrow \boxed{y = 2(x - \frac{1}{2})^2 - \frac{3}{2}}$$