

Warm-up

$$f(x) = -4x^2 + 8x + 5 \quad \text{Find:}$$

a) $x=0$

$$f(0) = -4(0)^2 + 8(0) + 5$$

$$= 5 \quad (0, 5)$$

a) y-int

d) axis of Symmetry

b) x-int(s)

e) Domain

c) vertex

f) Range

b) $f(x) = -(4x^2 - 8x - 5) = 0$

$$= -(2x+1)(2x-5) = 0$$

$$2x+1=0$$

$$x_1 = -\frac{1}{2} = -0.5$$

$$2x-5=0$$

$$x_2 = \frac{5}{2} = 2.5$$

c) $\frac{x\text{-value}}{\text{Vertex}} : \frac{x_1+x_2}{2} = \frac{-0.5+2.5}{2} = \frac{2}{2} = 1$

$\frac{y\text{-value}}{\text{Vertex}} : f(1) = -4(1)^2 + 8(1) + 5$
 $= 9 \quad (1, 9)$

d) Vertical line : $x = 1$

e) $x \in \mathbb{R}$

f) Down $y \leq 9$

vertex $(1, 9)$

Tu: Finish 1.3/1.4 @ work

Th: Go over Quiz @ work

Mon: Quiz 1.3/1.4

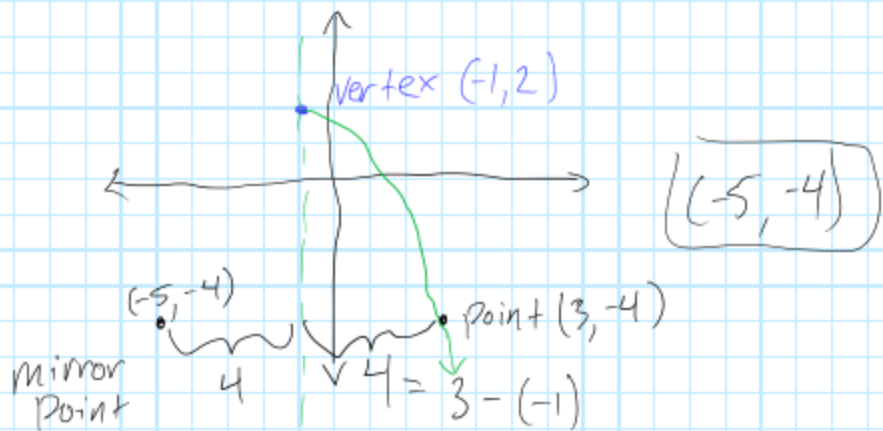
wed: Review

Fri: Test! ^{dup!}

Ex 1 Vertex $(-1, 2)$

Point $(3, -4)$

What other point is there
on the parabola?



General Form

$$f(x) = ax^2 + bx + c$$

Standard Form

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

same

(Good for
graphing)

$a > 0$; up
 $a < 0$; down

Vertex: (h, k)

$|a| < 1$; wide
 $|a| > 1$; narrow

Find i) Vertex ii) y-int
iii) x-int(s)

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

i) Vertex (h, k) $a(x-h)^2 + k$

$(1, 4)$ $h=1$ $k=4$

ii) $f(0) = -\frac{1}{4}(0-1)^2 + 4$

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

$= -\frac{1}{4} + \frac{16}{4} = \frac{15}{4}$ $(0, \frac{15}{4})$

iii) $f(x) = -\frac{1}{4}(x-1)^2 + 4 = 0$

~~$-\frac{1}{4}(x-1)^2 = -4$~~

$$(x-1)^2 = 16 \quad \text{Sq root}$$

$$x_1 = 1+4 = 5$$

$$x_2 = 1-4 = -3$$

$$(x-1) = \pm 4$$

$$x = 1 \pm 4$$

Ex 3 $f(x) = 3(x+1)^2 - 3$

i) $a(x-h)^2 + k$
 $(-1, -3)$ $h = -1$ $k = -3$

ii) $f(0) = 3(0+1)^2 - 3 = 3(1)^2 - 3$
 $= 3 - 3 = 0$ $(0, 0)$

iii) $f(x) = 0 = 3(x+1)^2 - 3$

$$\div 3 \quad 3 = 3(x+1)^2 \div 3$$

$$1 = (x+1)^2 \quad \text{Sq root} \quad \sqrt{1} = \pm 1$$

$$\pm 1 = (x+1)$$

$$\pm 1 = x$$

Since $(+1)^2 = 1$
 $(-1)^2 = 1$

$$x_1 = -1 + 1 = 0$$

$$x_2 = -1 - 1 = -2$$