

QUADRATICS REVIEW

Formulas to Know

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$h(t) = \frac{1}{2}at^2 + v_0t + s_0$$

$$a = \underline{-9.8} \text{ m/s}^2$$

$$a = \underline{-32} \text{ ft/s}^2$$

No calculator page

#1, 2, 3

Find vertex

Vertex Form

$$y = a(x-h)^2 + K$$

Vertex: (h, K)

$$y = ax^2 + bx + c$$

$$x = \frac{-b}{2a}$$

$y =$ Sub in x -coord

Intercept Form

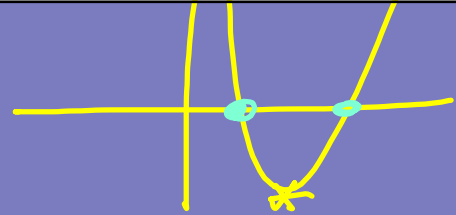
$$y = a(x-p)(x-q)$$

1) Find x -int: $x-p=0$
 $x=p$
 $x-q=0$
 $x=q$



$$x\text{-coord} = \frac{p+q}{2}$$

y -coord = Sub in x -coord.



SOLVE.

1) Set = 0.

- A) Finding zeros on calculator.
- B) Completing the square
- C) Factoring
- D) Quadratic formula

Find vertex.

$$y = -\frac{1}{3}(x-4)(x+2)$$

$$x-4=0 \quad x+2=0$$

x-int $\Rightarrow x=4 \quad x=-2$

$$\text{Vertex: } x = \frac{4 + (-2)}{2} = 1$$

$$y = -\frac{1}{3}(1-4)(1+2)$$

$$= -\frac{1}{3}(-3)(3)$$

$$= 3$$

$(1, 3)$

Vertex: $(1, 3)$

direction: down

line of sym: $x=1$

Wide

$$y < -2x^2 + 12x - 13$$

Vertex:

$$x = \frac{-b}{2a} = \frac{-12}{2(-2)}$$

$$= \frac{-12}{-4}$$

$$x = 3$$

0	0
1	-2
2	-8
3	-18

Line of Symm:

$$x = 3$$

$$y = -2(3)^2 + 12(3) - 13$$

$$= -18 + 36 - 13$$

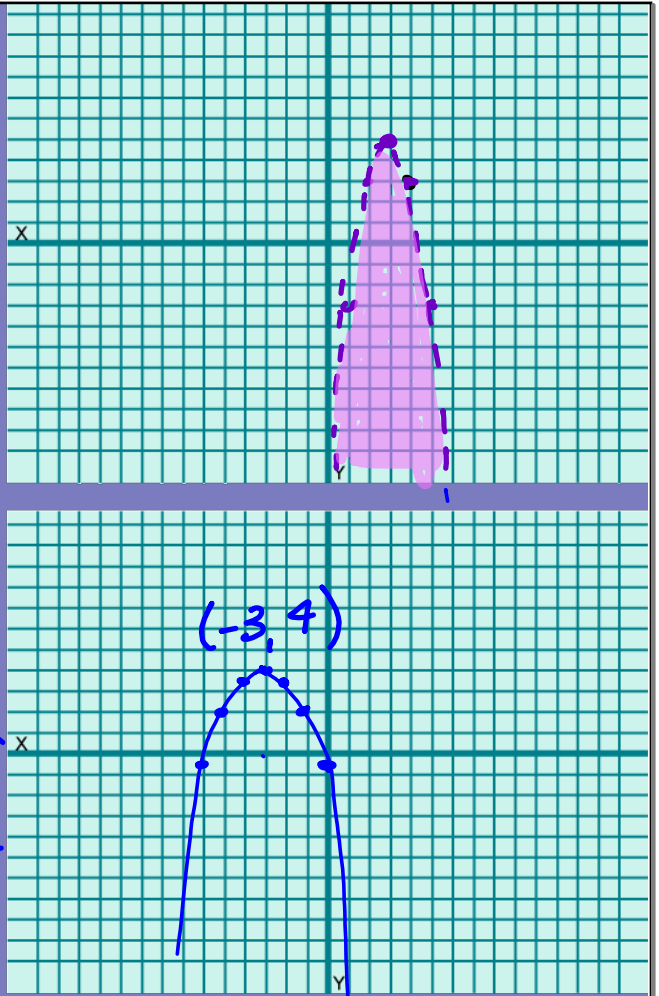
$$= 5$$

(3, 5)

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

$$y = -\frac{1}{2}(x+3)^2 + 4$$

0	0
1	$\frac{1}{2}$
2	1
3	$\frac{9}{2}$



Like #3

Vertex: $(-7, -2)$ Point: $(-5, 10)$

$$y = a(x+7)^2 - 2$$

$$10 = a(-5+7)^2 - 2$$

$$10 = 4a - 2$$

$$12 = 4a$$

$$3 = a$$

$$y = 3(x+7)^2 - 2$$

#4 Solve by Factoring

$$2x^2 - 3x - 20 = 0$$

$$(2x+5)(x-4) = 0$$

+5x	1	20
-8x	2	10
	4	5

$$2x+5=0 \quad x-4=0$$

$$2x = -5$$

$$x = -5/2$$

$$x = 4$$

Like b

$$7x = 14x^2$$

$$0 = 14x^2 - 7x$$

$$0 = 7x(2x-1)$$

$$7x=0 \quad 2x-1=0$$

$$x=0 \quad 2x=1$$

$$x = 1/2$$

Solve for x by completing the square:

$$\frac{4x^2}{4} + \frac{40x}{4} + \frac{28}{4} = \frac{0}{4}$$

$$x^2 + 10x + 7 = 0$$

$$x^2 + 10x + \underset{+5}{25} = -7 + 25$$

$$\sqrt{(x+5)^2} = \sqrt{18}$$

$$x+5 = \pm 3\sqrt{2}$$

$$x = -5 \pm 3\sqrt{2}$$

7/ Roots: $3, -\frac{2}{5}$

Find eq.

Reverse
factoring

$$x = 3$$

$$x = -\frac{2}{5}$$

$$x - 3 = 0$$

$$5x = -2$$

$$5x + 2 = 0$$

$$(x - 3)(5x + 2) = 0$$

$$5x^2 + 2x - 15x - 6 = 0$$

$$\boxed{5x^2 - 13x - 6 = 0}$$

Word problems

1) $\uparrow$ price $\downarrow$ sell = Maximize revenue - Find Vertex



$$(10+x)(15+x) = 300$$

- 1) FOIL
- 2) Set = 0
- 3) Solve

3) $h(t) = \frac{1}{2}at^2 + V_0t + S_0$

Maximum height: Find vertex

When will it be 50 ft.?

$$50 = \underline{\hspace{2cm}}$$

Solve.

