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Forms of Quadratics

Vertex Form

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

Vertex: (h, k)

Line of symmetry: $x = h$

Direction: $+a$ up, $-a$ down

Standard Form

$y = ax^2 + bx + c$

Vertex:

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

$y =$ sub in x-coord

Intercept Form

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

Gives x-intercepts.

Vertex:

1) Solve: x-int $x-p=0$ $x-q=0$, $x=p$ $x=q$

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

3) y-coord = sub in x-coord.

$y = ax^2 + bx + c$

$x = \frac{-b}{2a}$ $y =$ sub in x-coord

$y = 5(x-3)^2 + 1$

Vertex: $(3,1)$

$y = 5(x-3)(x-3) + 1$

$y = 5(x^2 - 3x - 3x + 9) + 1$

$= 5(x^2 - 6x + 9) + 1$

$= 5x^2 - 30x + 45 + 1$

$ax^2 + bx + c$

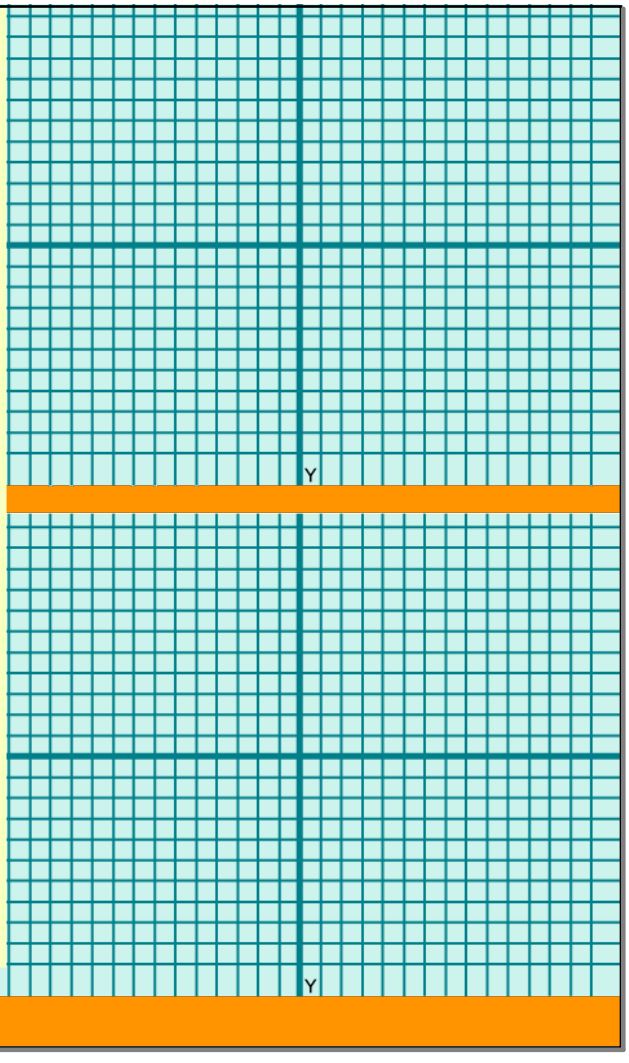
$= 5x^2 - 30x + 46$

$x = \frac{-(-30)}{2(5)} = \frac{-b}{2a} = 3$

$y = 5(3)^2 - 30(3) + 46$

$= 45 - 90 + 46$

$= 1$ $(3,1)$



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$y \leq -\frac{1}{a}x^2 + \underset{b}{6}x - \underset{c}{15}$

Vertex: $x = \frac{-b}{2a} = \frac{-6}{2(-1/2)} = \frac{-6}{-1} = 6$

$y = -\frac{1}{a}(6)^2 + 6(6) - 15$

$= -18 + 36 - 15$

$= 3$

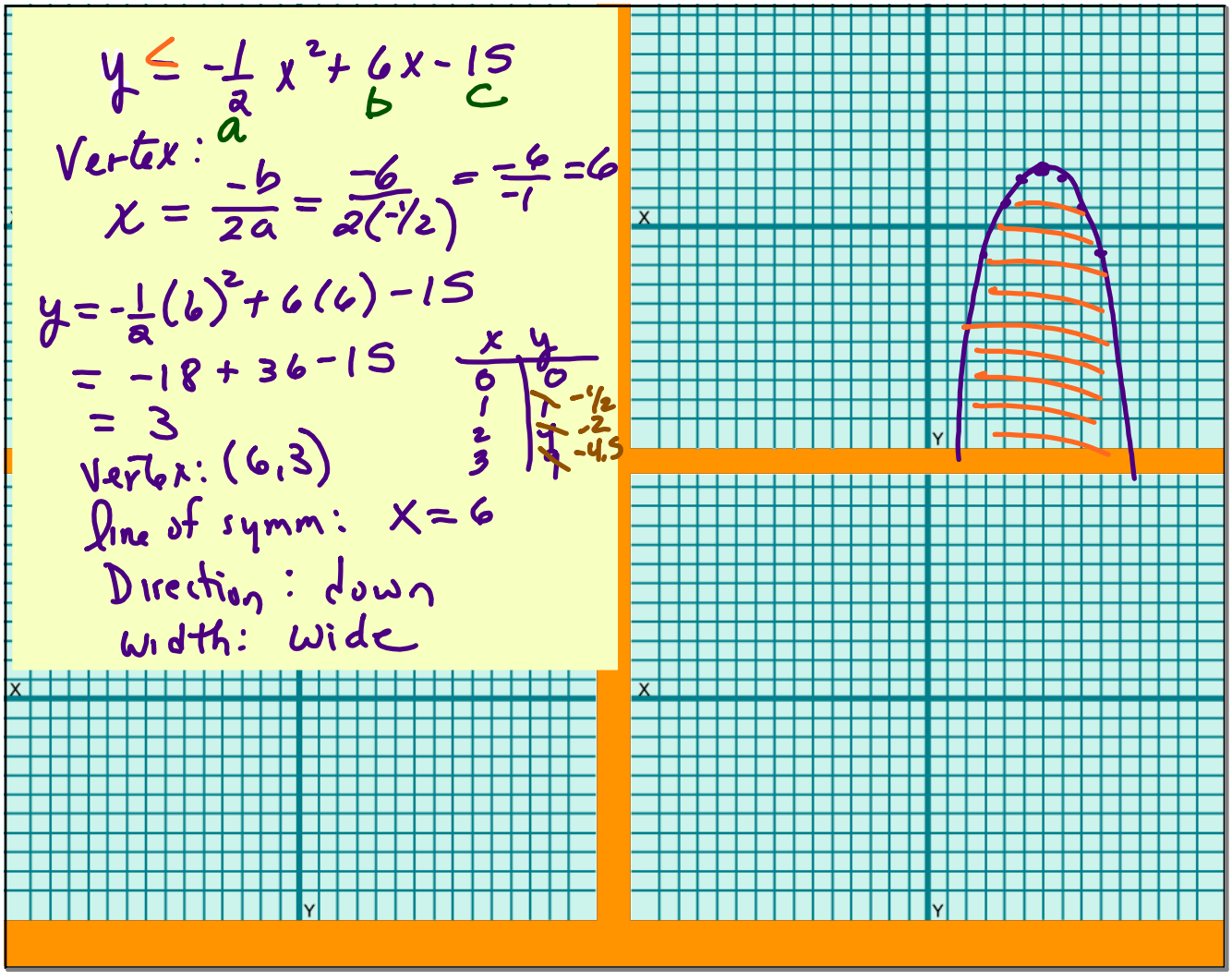
Vertex: $(6, 3)$

x	y
0	0
1	-1/2
2	-2
3	-4.5
4	-8

line of symm: $x = 6$

Direction: down

width: wide



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Intercept Form

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

$x-3=0 \quad x+7=0$

$x=3 \quad x=-7$

x-intercepts

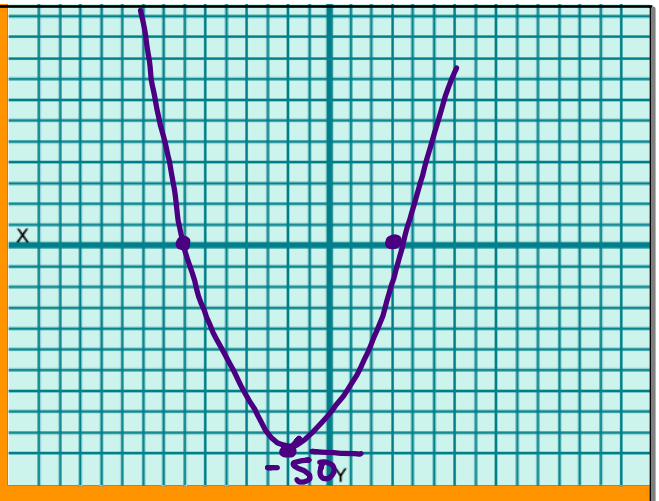
x-coord $= \frac{3+-7}{2} = \frac{-4}{2} = -2$

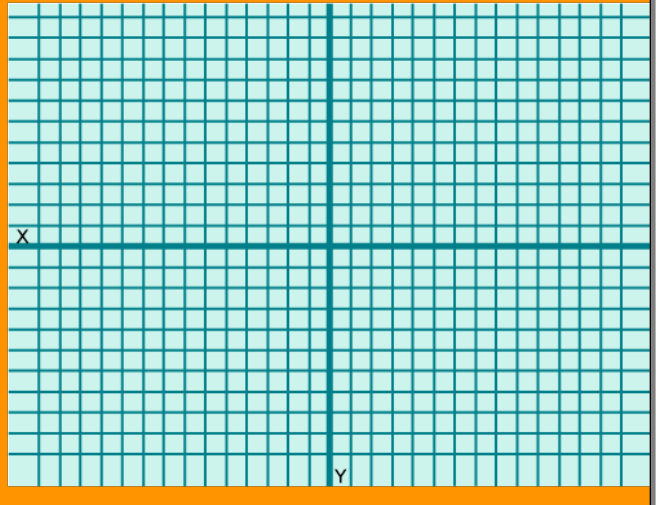
$y = 2(-2-3)(-2+7)$

$= 2(-5)(5) = -50$

Vertex $(-2, -50)$

y





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$y < 3(x+2)(x+4)$

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

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

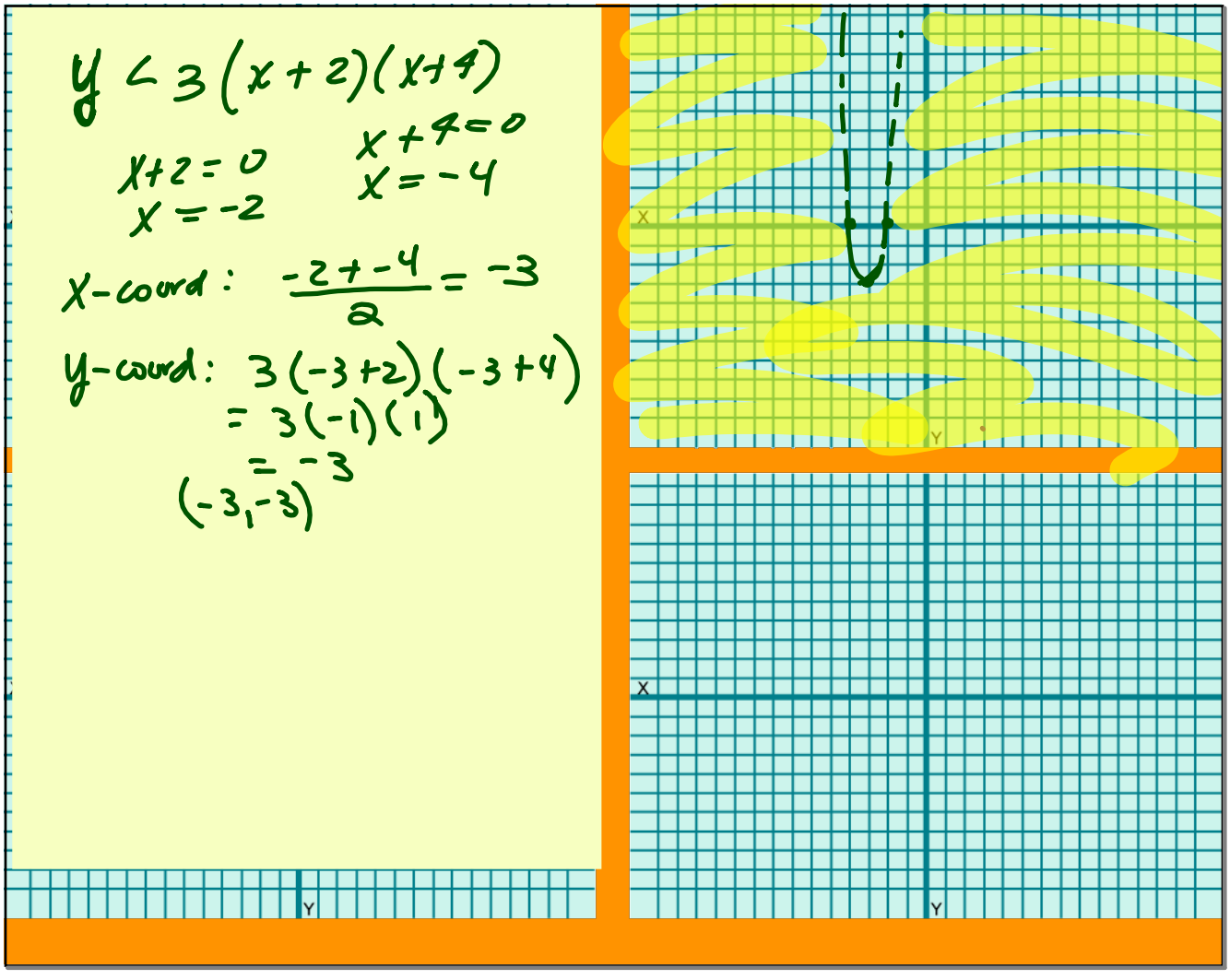
x-coord: $\frac{-2+-4}{2} = -3$

y-coord: $3(-3+2)(-3+4)$

$= 3(-1)(1)$

$= -3$

$(-3,-3)$



1) 1972, Mercury Comet = $3200

$v(t) = 18.75t^2 - 450t + 3200$

What was its lowest value.

$t = -\frac{b}{2a} = \frac{+(+450)}{2(18.75)} = 12$ yrs

$\begin{array}{r} 1972 \\ +12 \\ \hline 1984 \end{array}$

$V = 18.75(12)^2 - 450(12) + 320$

$= \$500$