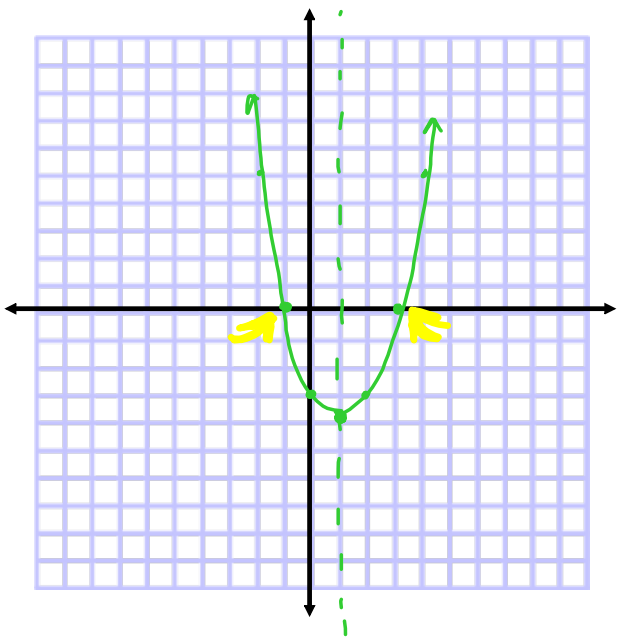
Bellwork



$(1)^2-2(1)-3$

Graph $y = x^2 - 2x - 3$

$x=\frac{2}{2(1)}=1$ V: $(1,-4)$

vertex form:

$y=(x-1)^2-4$

intercept form: factor ( )( )

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

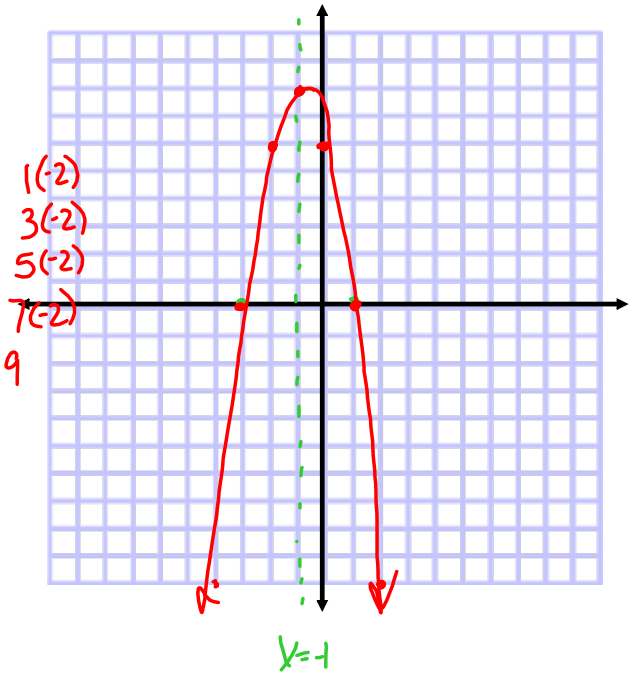
Domain: $(-1,0)$ $(3,0)$

$\mathbb{R}$

Range:

$[-4,\infty)$ interval

$y\geq -4$ inequality



$-2(-2)(2)$

$-2(-1-1)(-1+3)$

Graph $y = -2(x - 1)(x +3)$

$(1,0)$ $(-3,0)$

multiply

standard form:

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

$y=-2(x^2+3x-x-3) \Rightarrow y=-2x^2-4x+6$

vertex form: V: $(-1, 8)$

$y=-2(x+1)^2+8$

x-intercept(s): $(1,0)$ $(-3,0)$

y-intercept: $(0,6)$

Quick review

Solve: factor / technique "square root both sides"

$\frac{4(x - 4)^2}{4} = \frac{24}{4}$

$\sqrt{(x-4)^2} = \sqrt{6}$

$x - 4 = \pm\sqrt{6}$

$x = 4 \pm \sqrt{6}$

$3(x + 10)^2 - 21 = 0$

$3(x+10)^2 = 21$

$\sqrt{(x+10)^2} = \sqrt{7}$

$x + 10 = \pm\sqrt{7}$

$x = -10 \pm \sqrt{7}$

$x^2 - 8x - 20 = 0$

1·20
2·10
4·5

$(x+2)(x-10) = 0$

$x = -2, 10$

$3x^2 - 13x = 10$

$3x^2 - 13x - 10 = 0$

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

$x = -2/3, 5$

What makes the following 2 expressions a perfect square trinomial?

$x^2 + 8x + 16$

$(x+4)(x+4)$

$(x+4)^2$

$x^2 + 12x + 36$

$(x+6)(x+6)$

$(x+6)^2$

Find the value of "c" that makes the expression a perfect square trinomial. Then write the expression as the square of a binomial.

$x^2 + 10x + c$ 25

$\left(\frac{10}{2}\right)^2$

$\left(\frac{b}{2}\right)^2$

"c"

$(x+5)(x+5)$

$(x+5)^2$

$x^2 - 14x + c$ 49

$\left(\frac{-14}{2}\right)^2$

$(x-7)(x-7)$

$(x-7)^2$

$x^2 - 3x + c$

$\left(\frac{-3}{2}\right)^2$

$x^2 - 3x + \frac{9}{4}$

$\left(-\frac{3}{2}\right)\left(-\frac{3}{2}\right)$

$\left(\frac{b}{2}\right)\left(\frac{b}{2}\right)$

$\left(x - \frac{3}{2}\right)\left(x - \frac{3}{2}\right)$

$(x - 3/2)^2$

$x^2 + 5x + c$

$\left(\frac{5}{2}\right)^2$

$(x + 5/2)(x + 5/2)$

$\left(\frac{5}{2}\right)\left(\frac{5}{2}\right)$

$(x + 5/2)^2$

Solve by completing the square:

$x^2 - 10x + 22 = 0$

1) L.C. $1x^2$

2) Separate (x's 1 side #'s other side)

$x^2 - 10x + \underline{25} = -22 + \underline{25}$

c

$\sqrt{(x-5)^2} = \sqrt{3}$

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

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

3) Find "c" $\left(\frac{b}{2}\right)^2$

4) Balance

5) $(\quad)^2$

6) Solve

$x^2 + 12x - 54 = 0$

$x^2 + 12x + \underline{36} = 54 + \underline{36}$

$\sqrt{(x+6)^2} = \sqrt{90}$

$x + 6 = \pm\sqrt{90}$

$x = -6 \pm \sqrt{90}$

$x = -6 \pm 3\sqrt{10}$

$x^2 - 8x = -8$

$x^2 - 8x + \underline{16} = -8 + \underline{16}$

$\sqrt{(x-4)^{\cancel{2}}} = \sqrt{8}$

$x - 4 = \pm\sqrt{8}$

$x = 4 \pm 2\sqrt{2}$

$2x^2 + 28x = -36$

$x^2 + 14x + \underline{49} = -18 + \underline{49}$

$\sqrt{(x+7)^{\cancel{2}}} = \sqrt{31}$

$x + 7 = \pm\sqrt{31}$

$x = -7 \pm \sqrt{31}$

$2(x^2 + 14x + \underline{49}) = -36 + \underline{98}$

$2(x+7)^2 = 62$

$(x+7)^2 = 31$

$x + 7 = \pm\sqrt{31}$

$x = -7 \pm \sqrt{31}$

$3x^2 - 12x + 4 = 0$

$3x^2 - 12x = -4$

$3(x^2 - 4x + \underline{4}) = -4 + \underline{12}$

$3(x-2)^2 = 8$

$\sqrt{(x-2)^{\cancel{2}}} = \sqrt{\frac{8}{3}}$

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

$x = 2 \pm \frac{2\sqrt{6}}{3}$

$5x^2 + 20x + 2 = 0$

$5x^2 + 20x = -2$

$5(x^2 + 4x + \underline{4}) = -2 + \underline{20}$

$5(x+2)^2 = 18$

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

$x + 2 = \pm\sqrt{\frac{18}{5}}$

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

$x = -2 \pm \frac{3\sqrt{10}}{5}$

Write in vertex form by using completing the square method:

$y = x^2 - 10x - 20$ $\quad (\quad)^2 + \_\_$

$y = x^2 - 10x + \underline{25} \quad -20 + \underline{-25}$

$y = (x-5)^2 - 45$

STOP

vertex form

$y = 3x^2 - 6x + 1$

$y = 3x^2 - 6x \quad + 1$

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

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

Stop

$y = x^2 + 4x + 5$

$y = x^2 + 4x + \underline{4} \quad +5 + \underline{-4}$

$y = (x+2)^2 + 1$

$y = 3x^2 - 12x + 7$

$y = 3x^2 - 12x \quad +7$

$y = 3(x^2 - 4x + \underline{4}) + 7 + \underline{-12}$

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