(1) $6x^2 + 3(-x+2)^2 = 12$

$6x^2 + 3(x^2 - 4x + 4) = 12$

$6x^2 + 3x^2 - 12x + 12 = 12$

$9x^2 - 12x = 0$

$3x(3x-4) = 0$

$(0, 2)$

$\left(\frac{4}{3}, \frac{2}{3}\right)$

② $-(x^2 - y + 3 = 0)$

$y = x^2 + 3$

$x^2 + y^2 = 9$

$+ \quad -x^2 + y - 3 = 0$

$y^2 + y - 3 = 9$

$y^2 + y - 12 = 0$

$(y+4)(y-3) = 0$

$(0, 3)$

$x^2 + y^2 = 9$

$y = -4$	$x^2 + 9 = 9$
$x^2 + 16 = 9$	$x^2 = 0$
$x^2 = -7$	$x = 0$

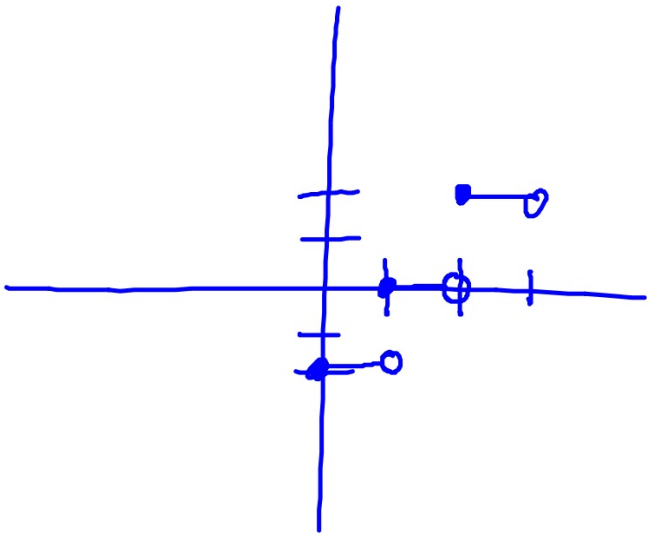
⑦ $y = 2[x-1]$

parent: $y = [x]$

Key point
(1, 0)

length of bar: $\frac{1}{b} = 1$

distance: 2

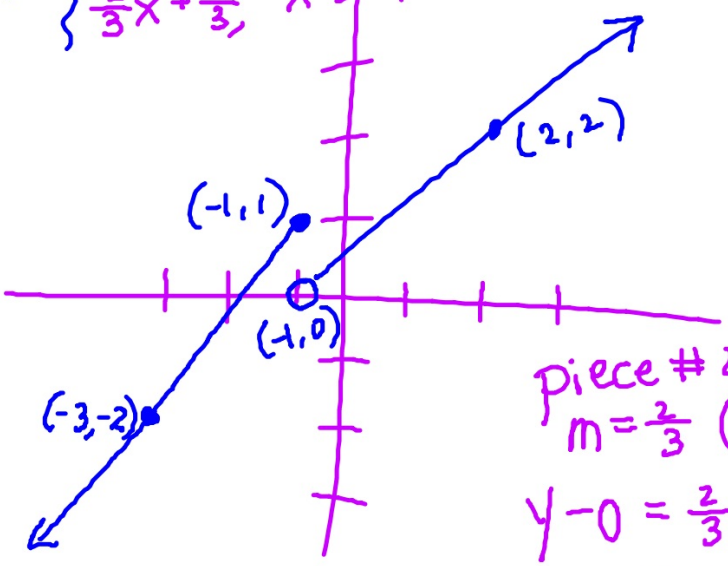


More Piecewise functions

skip #7

$\phi \approx 1.618$

$$f(x)=\begin{cases}\frac{3}{2}x+\frac{5}{2}, & x\le -1\\ \frac{2}{3}x+\frac{2}{3}, & x>-1\end{cases}$$



piece #1

(-1,1) (-3,-2)

$m=\frac{3}{2}$

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

$y=\frac{3}{2}x+\frac{3}{2}+1$

$y=\frac{3}{2}x+\frac{5}{2}$

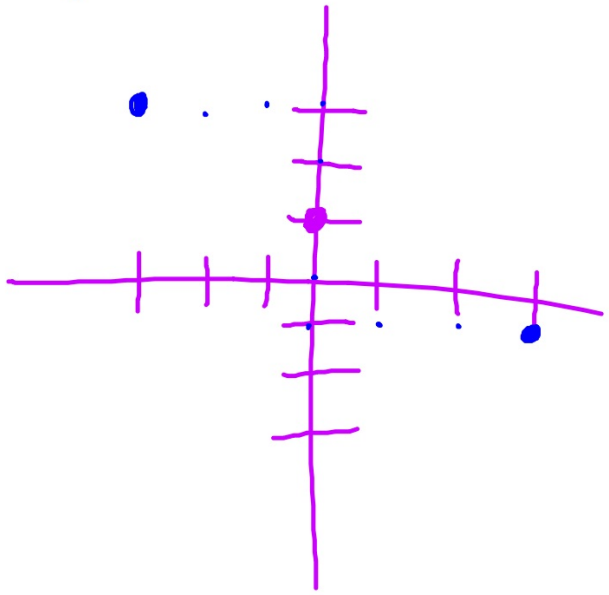
piece #2

$m=\frac{2}{3}$ (-1, 0)

$y-0=\frac{2}{3}(x+1)$

$y=\frac{2}{3}x+\frac{2}{3}$

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

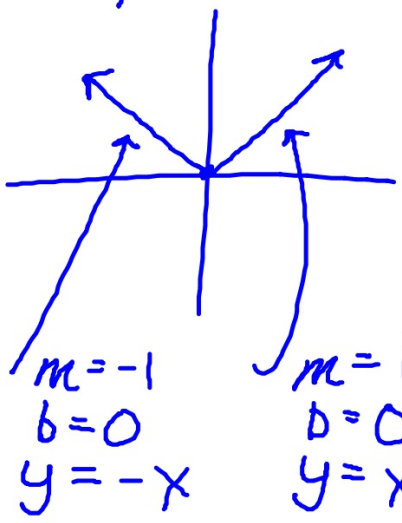


$\frac{-2}{3}$

$\frac{2}{-3}$

Sketch. Rewrite the function as a piecewise function.

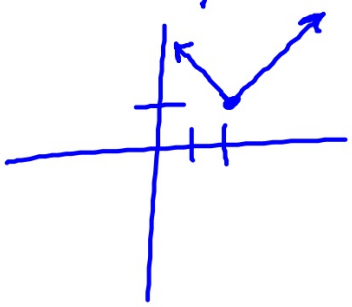
$y = |x|$



$$f(x) = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$$

Sketch. Rewrite the function as a piecewise function.

$y = |x-2|+1$



$$f(x) = \begin{cases} -x+3, & x \le 2 \\ x-1, & x > 2 \end{cases}$$

piece #1

$m = -1$

$(2,1)$

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

$y = -x+3$

piece #2

$m = 1$

$(2,1)$

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

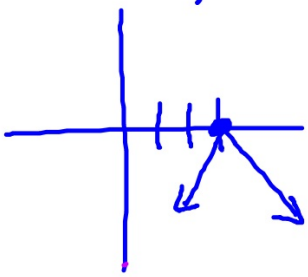
$y = x-1$

Sketch. Rewrite the function as a piecewise function.

$y = -|2x-6|$

$y = -|2(x-3)|$

$$f(x) = \begin{cases} 2x-6, & x < 3 \\ -2(x-3), & x \geq 3 \end{cases}$$



piece #1

$m = 2$

$(3, 0)$

$y - 0 = 2(x-3)$

$y = 2x - 6$

piece # 2

$m = -2$

$(3, 0)$

$y - 0 = -2(x-3)$

$y = -2x + 6$