

Graph: $Ax + By = C$

$$y = mx + b$$

$$f(x) = mx + b$$

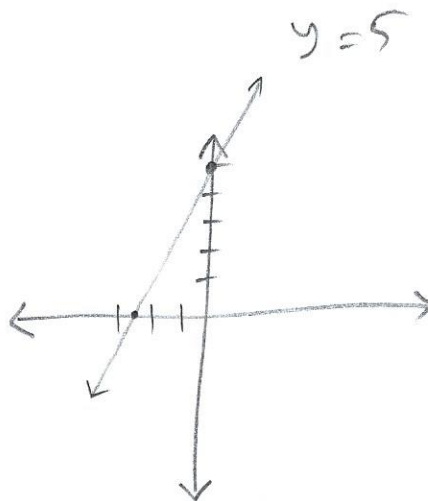
Graph: $y = 2x + 5$

x-intercept $(-2.5, 0)$

y-intercept $(0, 5)$

$$\begin{array}{r} 0 = 2x + 5 \\ -5 \quad -5 \\ \hline -5 = \frac{2x}{2} \end{array}$$

$$x = -2.5$$

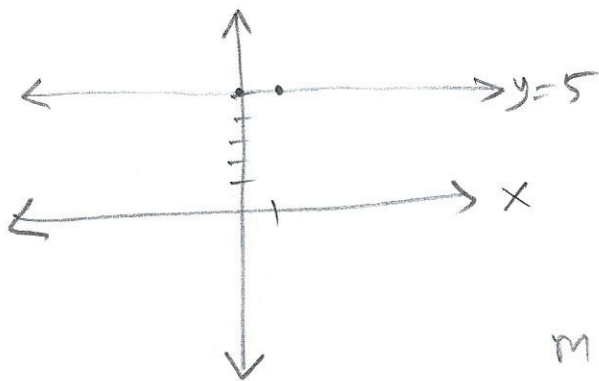


Graph: $y = 5$

$$f(x) = 5$$

y-intercept $(0, 5)$
x-intercept none

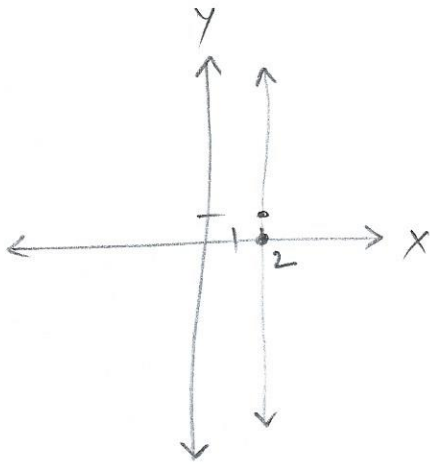
x	y
0	5
1	5



$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$$

$$m = \frac{0}{1} = 0$$

Graph: $x = 2$



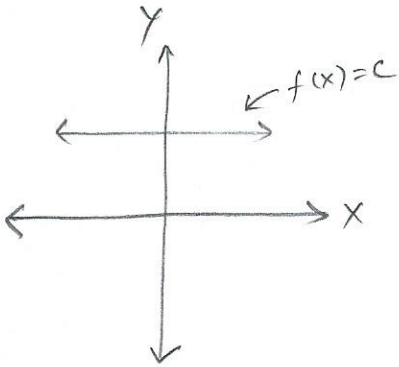
x	y
2	0
2	1

x-intercept: $(2, 0)$

y-intercept: none

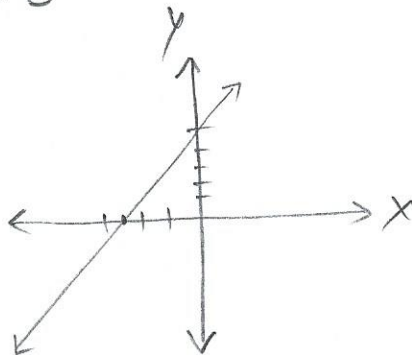
$$m = \frac{1-0}{2-2} = \frac{1}{0} = \text{undefined}$$

① $f(x) = c$ constant function



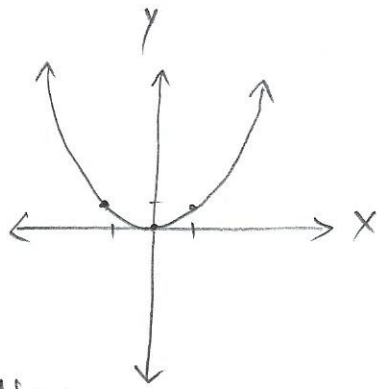
② linear function

$$f(x) = mx + b$$



③ Quadratic function

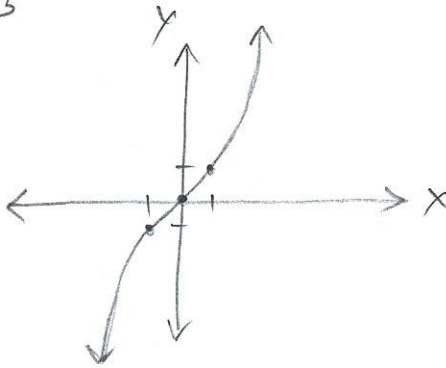
$$f(x) = x^2$$



x	y
1	1
0	0
-1	1
2	4
-2	4

④ Cubic function

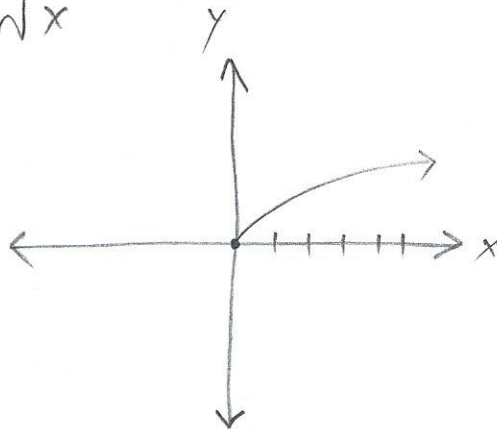
$$f(x) = x^3$$



x	y
1	1
0	0
-1	-1

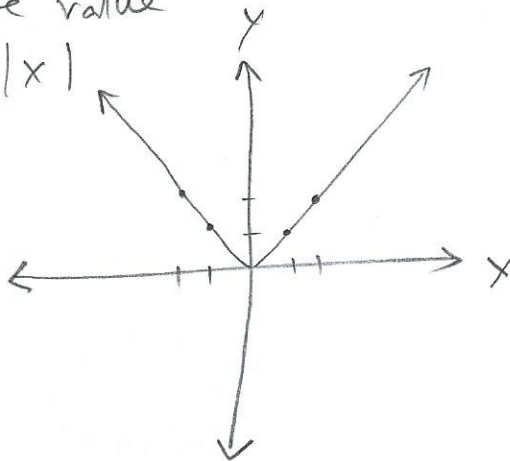
⑤ Square root function

$$f(x) = \sqrt{x}$$



⑥ Absolute value

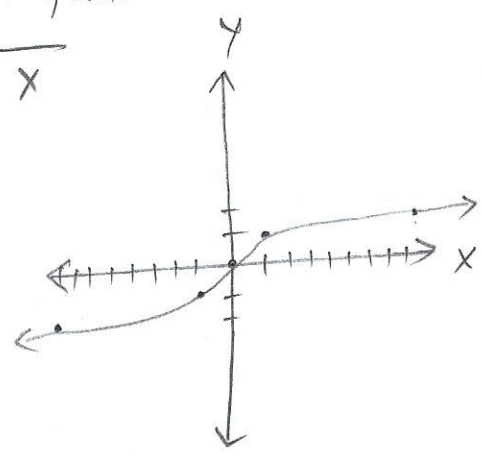
$$f(x) = |x|$$



x	y
2	2
1	1
0	0
-1	1
-2	2

⑦ Cube root function

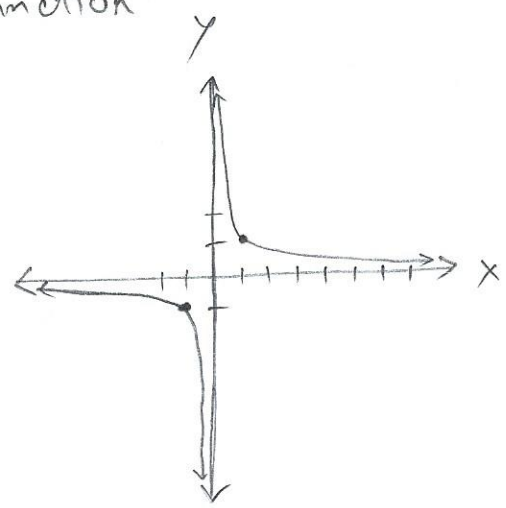
$$f(x) = \sqrt[3]{x}$$



x	y
8	2
1	1
0	0
-1	-1
-2	2

⑧ Reciprocal function

$$f(x) = \frac{1}{x}$$



x	y
2	1/2
1	1
0	undefined
1/2	2

① $y = \frac{1}{4}x + 2$

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

x-intercept: let $y = 0$

y-int: let $x = 0$

$$0 = \frac{1}{4}x + 2$$

$$-2 = \frac{1}{4}x$$

$$-8 = x$$

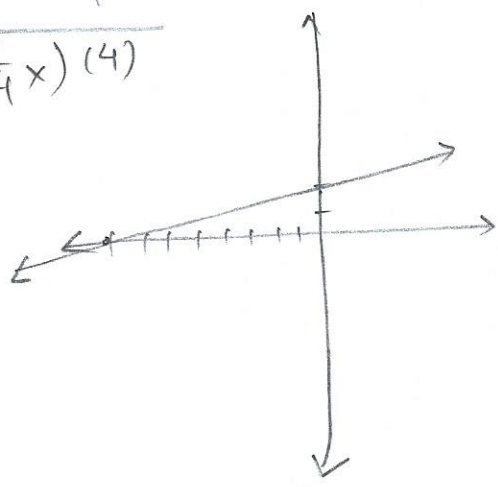
$$y = 2$$

$$(0, 2)$$

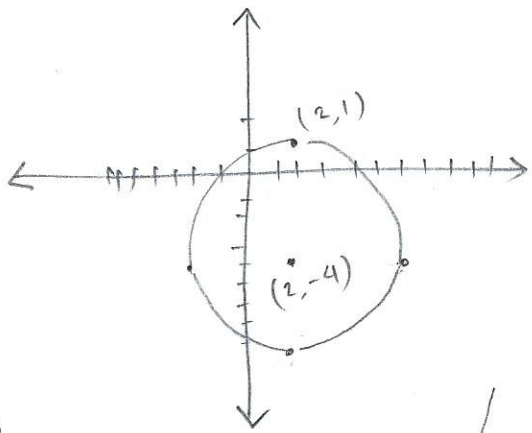
$$(4)(-2) = \left(\frac{1}{4}x\right)(4)$$

$$-8 = x$$

$$(-8, 0)$$



② $(x-h)^2 + (y-k)^2 = r^2$
 $(x-2)^2 + (y+4)^2 = 25$
 Center: $(2, -4)$
 radius: 5

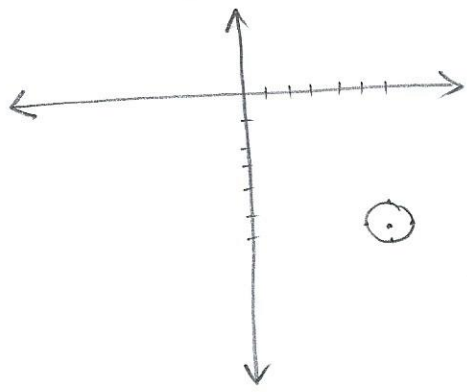


③ $x^2 + y^2 - 12x + 12y + 71 = 0$

Rearrange $x^2 - 12x + \boxed{36} + y^2 + 12y + \boxed{36} = -71 + 36 + 36$

$(x-6)^2 + (y+6)^2 = 1$

Center: $(-6, -6)$
 radius: 1



$$\frac{x^2}{(-\frac{12}{2})^2} = \frac{y^2}{(\frac{12}{2})^2}$$

$$= (-6)^2 = 36$$

$$= 6^2 = 36$$

④ $f(x) = \sqrt{2x+3}$

to find domain

$$\begin{array}{r} 2x+3 \geq 0 \\ -3 \quad -3 \end{array}$$

$$\frac{2x}{2} \geq \frac{-3}{2}$$

$$x \geq -3/2$$

Domain: $[-3/2, \infty)$

$$f(x) = \frac{3x-7}{4x-1}$$

$$\begin{array}{r} 4x-1 \neq 0 \\ +1 \quad +1 \end{array}$$

$$4x \neq 1$$

$$x \neq 1/4$$

D: $(-\infty, 1/4) \cup (1/4, \infty)$

$$f(x) = 5x + 3$$

$$D: (-\infty, \infty)$$

○ # $f(x) = 5x + 3$

$$\begin{aligned} \text{Find } f(-3) &= 5(-3) + 3 \\ &= -15 + 3 \\ &= -12 \end{aligned}$$

Find $f(x+h)$

$$\begin{aligned} f(x+h) &= 5(x+h) + 3 \\ &= 5x + 5h + 3 \end{aligned}$$