

§ Lines

Definition: A function is a rule that assigns to each input, exactly 1 output.

$$\text{Ex)} \quad f(x) = x^3$$

input: $x=2$ (or any other valid x -value)

$$\text{Output: } 2^3 = 8$$

$$f(x) = \underbrace{x^3}_{\text{"output"}}$$

input

Definition: Domain: Set of all
possible inputs

Ex) Find domain of $f(x) = x^3$

Domain: All real #'s.

Ex) Find domain of $g(x) = \sqrt{x-3}$

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

Definition: Range: set of all possible outputs

Example from Online Homework

Given $n(M) = -M^2 + 10M + 10$

M	-2	-1	0	1	2
$n(M)$	-14	-1	10	19	26

$$\begin{aligned} \textcircled{a} \quad n(-2) &= -(-2)^2 + 10(-2) + 10 \\ &= -4 - 20 + 10 \\ &= -24 + 10 = -14 \end{aligned}$$

$$h(-1) = -(-1)^2 + 10(-1) + 10$$

$$= -1 - 10 + 10$$

$$= -11 + 10 = \text{Er} -1$$

$$h(1) = -(1)^2 + 10(1) + 10$$

$$= -1 + 10 + 10$$

$$= 19$$

$$h(2) = -(2)^2 + 10(2) + 10$$

$$= -4 + 20 + 10$$

$$\text{Ex)} \quad r(w) = 2w^2 + dw + 2$$

$$r(-2) = 2(-2)^2 + d(-2) + 2$$

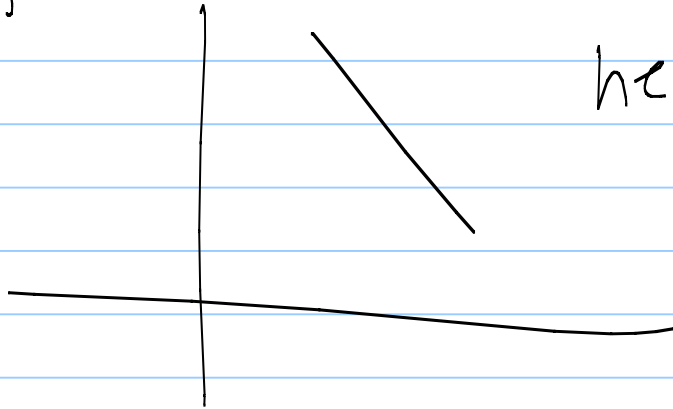
$$= 8 - 2d + 2$$

$$= \underline{\underline{10 - 2d}}$$

Lines:



positive
Slope



negative
Slope

Slope-Intercept form of a line

$$y = mx + b$$

m: slope : $\frac{\text{rise}}{\text{run}}$

Given 2 pts, the slope of the line connecting them is given

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

where

$$(x_1, y_1) \neq$$

$$(x_2, y_2)$$

are your points

Ex) Find equation of a line with slope = 3, passing through $(1, 4)$.

→ Start with equation of line

$$y = mx + b$$

$$y = 3x + b$$

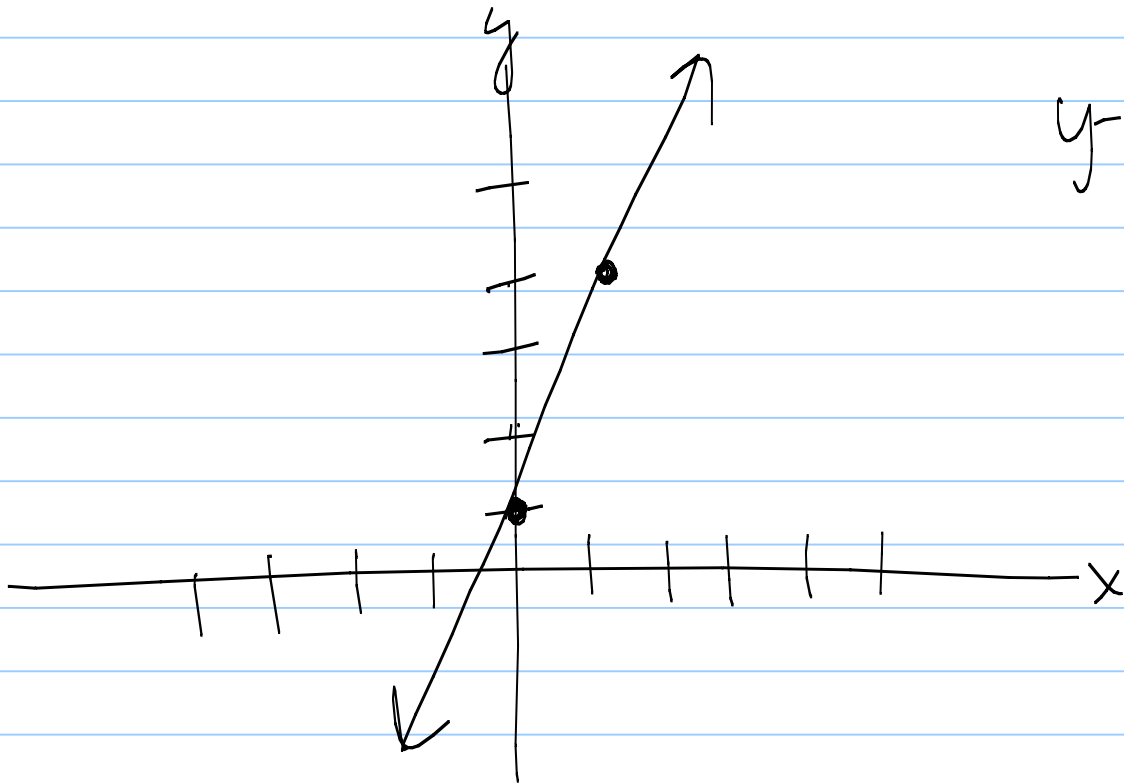
y-intercept

$$4 = 3(1) + b$$

$$4 = 3 + b$$

$$1 = b$$

Equation of line: $y = \frac{3}{1}x + 1$ | Answer



y-int:
where
you
cross
the
y-axis

Ex) From online HW

$$8x + 9 = 3x + \square$$

Solution is $x = -6$

$$8(-6) + 9 = 3(-6) + \square$$

∴
Solve for box