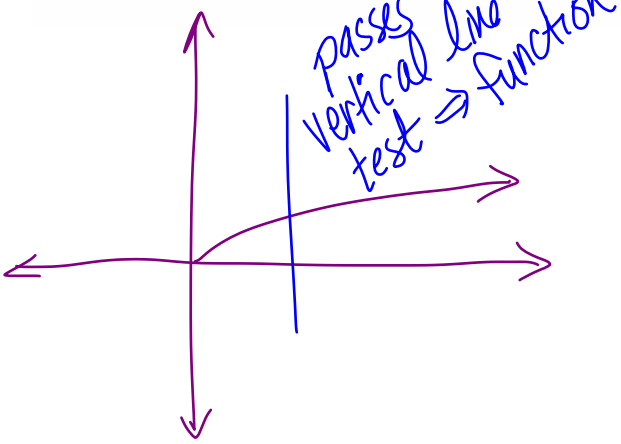
Objective #2 AM: Determine if relations are functions

1. Which of the following is *not* a function?

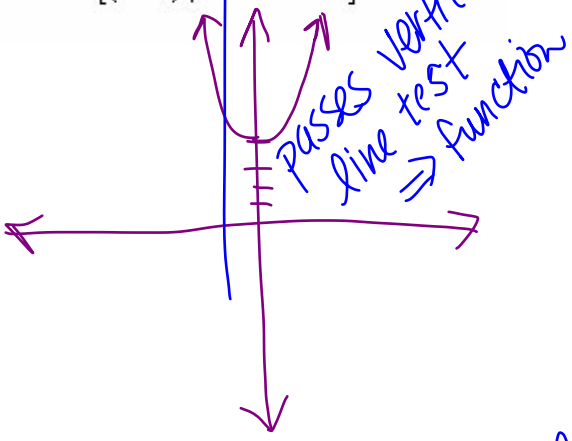
[A] $x = 2y^2 + 4$ ⇒ not a function.

[B] $\{(3, -4), (-5, 2), (-1, -4)\}$ each x has only 1 y ⇒ function

[C] $\{(x, y) \mid y = 2\sqrt{x},\ x \geq 0\}$



[D] $\{(x, y) \mid y = 2x^2 + 4\}$



2. Which of the following is a function?

[A] $\{(-8, -5), (-5, -4), (-8, -3)\}$ no!

[B] $(-8, -5, -4, -3)$ — no y values ⇒ no!

[C] $\{(-8, -5), (-4, -3), (-4, -8), (-3, -4)\}$ no!

[D] $\{(-8, -5), (-5, -8), (-3, -3)\}$ each x has only 1 y ✓

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3. Which of the following data represents wind speed as a function of lift?

= lift is your input or x value.

[A]

wind speed (m / h)	10	20	30	40
lift (ft / s)	7.5	13	17.9	21

y each x has only 1 y ✓

[B]

wind speed (m / h)	10	20	30	40
lift (ft / s)	19.8	24.8	19.8	28.1

y ✗ no!

[C]

wind speed (m / h)	10	20	30	40
lift (ft / s)	5.2	9.2	12.9	9.2

y ✗ no!

[D] none of these

4. Is the relation $\{(x, y) \mid x = 3y^2 + 1\}$ a function?

No. There are two y-values for many x values.

$x = 3y^2 + 1$

$-1 \quad -1$

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

$\pm\sqrt{\frac{x-1}{3}} = \sqrt{y^2}$

gives 2 y values

$\pm\sqrt{\frac{x-1}{3}} = y$