

January 27, 2015

$$\{x \in \mathbb{R} \mid x \leq 8\}$$

Input  $x$ s  
abscissa

Some "Rule"

Output  $y$ s  
ordinate

Range

2<sup>nd</sup> Entry

Domain  
1<sup>st</sup> Entry  
Horizontal Coordinate

Vertical Coordinate

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Test ① → ordered Pairs

a.) Do we have a repeat of  $x$ 's?  
Yes or no  
↓  
a function

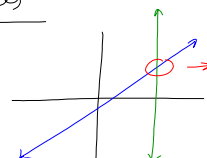
Is the  $y$  the same?  
Yes or no  
↓  
a function      ↓  
Not a function

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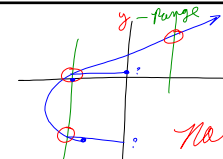
Test ② → when we have a Graph

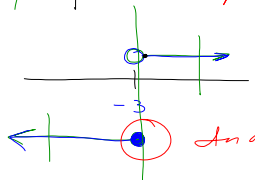
\* Use the "Vertical Line Test"

examples

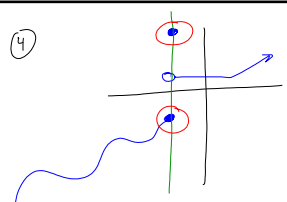
①  → only "one" intersection, then it is a function.

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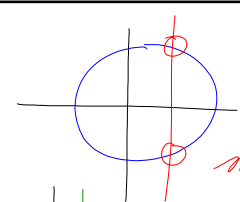
②  → Not a function

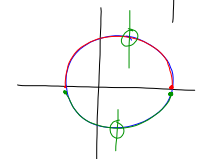
③  → In a function!

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④ 

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⑤   $x^2 + y^2 = 1$   
→ Not a function



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Restrictions of the Domains of Functions

$f \mid x \rightarrow x + 3$   
Input Rule  $\rightarrow$  output

$f \mid 2 \rightarrow 5$

$f \mid -4 \rightarrow -1$

$f \mid \frac{3}{4} \rightarrow \frac{15}{4}$

$\frac{\frac{3}{4} + 3}{\frac{3}{4} + 12} = \frac{4}{\frac{15}{4}}$

*\* Do Express the Domain:*

① D.B. =  $\{x \in \mathbb{R}\}$   
 $= \mathbb{R}$

② I.N.  $(-\infty, \infty)$

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$f \mid x \rightarrow x + 3$   
 Domain =  $\{x \in \mathbb{R}\}$

$f(x) = x + 3 = \text{output (y)}$   
Input Rule

$f(x) = y$

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$f(x) = \frac{1}{x}$  *Rational Function*

①  $f(3) = \frac{1}{3}$

②  $f(0) = \frac{1}{0}$  *Undefined!*

*express Domain*

D.B. =  $\{x \in \mathbb{R} \text{ and } x \neq 0\}$

I.N.  $(-\infty, 0) \cup (0, \infty)$

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Read "B" Functions

↓

Read "a" Linear

"B"

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$\{x \in \mathbb{N} \mid x \geq 2\}$

or

$\{x \in \mathbb{Z} \mid 3 \leq x \leq 4\}$

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