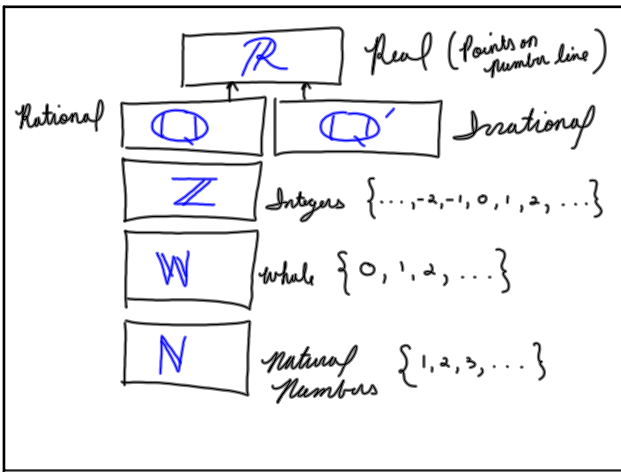


September 12, 2016  
 \* Quiz - Wednesday  
 • Complex Fractions

Sep 12-10:52 AM

Sets: a collection of things.  
 ↓  
 members or elements

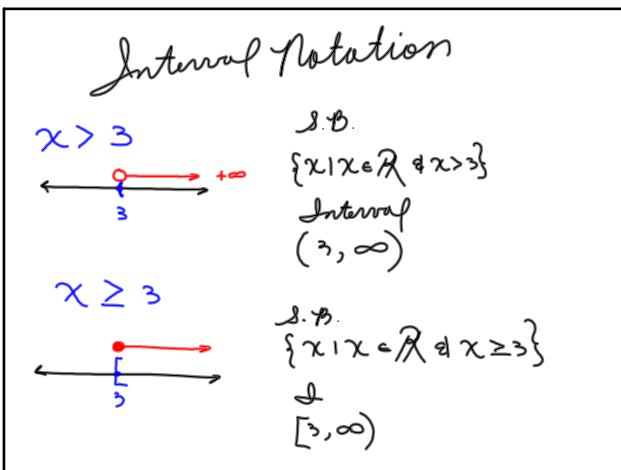
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Rational Numbers:  
 $\mathbb{Q} = \left\{ \frac{a}{b} \mid a \in \mathbb{Z}, b \in \mathbb{Z}, b \neq 0 \right\}$   
 ↑ such that (:)  
 ↑ element of  
 $\mathbb{Q}' = \{ \text{numbers that are not Rational} \}$   
 $\pi, e, \sqrt{2}, \sqrt{3}, \sqrt{5}, \sqrt[3]{2}$

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Functions

① Relation: a collection of ordered pairs.  
 e.g.  $R = \{(2, 5), (-4, 2), (4, -3)\}$

② Function: is a Relation

Def of a Function: a Relation is a function if and only if each object in the domain is paired with one and only one object in the range.

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$$R = \{ (2, 5), (-6, 8), (4, -5) \}$$
 ordered Pairs:  $(x, y)$   
 (Domain, Range)  
 Domain of  $R = \{ 2, -6, 4 \}$   
 Range of  $R = \{ 5, 8, -5 \}$  \* a function

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$$R = \{ (2, 3), (4, 0), (2, -9) \}$$

$$D: \{ 2, 4 \}$$

$$R: \{ 3, 0, -9 \}$$
 \* Not a function

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$(-3, 2)$   
 $(-5, 6)$  not a function  
 $(-5, 4)$  \* fails Vertical line test

$x = -5$

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Function Machine

In put $x$ Domain	Rule $3x$	out put $y$ or $f(x)$ Range
-4	$(-4, -12)$	-12
0	$(0, 0)$	0
5	$(5, 15)$	15

↑  
are there repeats in the Domain?

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$(5, 6)$   
 $(-2, 6)$   
 $(18, 6)$   
 $(-23, 6)$

$y = 6$

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$$f(x) = \frac{3x}{x-5} = 0$$
 Rule  $x \neq 5$

Domain:  $(-\infty, 5) \cup (5, \infty)$   
 $\{x \mid x \in \mathbb{R} \wedge x \neq 5\}$

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