

# Section 1.2: The Real Numbers

Tuesday, September 24, 2013  
9:52 AM

natural numbers  $N = \{1, 2, 3, \dots\}$

whole numbers  $W = \{0, 1, 2, 3, \dots\}$

integers  $Z = \{\dots -3, -2, -1, 0, 1, 2, 3, \dots\}$

rational numbers  $Q = \left\{ \frac{a}{b} \mid a \text{ and } b \text{ are integers and } b \neq 0 \right\}$

Examples:  $\frac{5}{7}, -\frac{3}{8}, \frac{119}{157}, -4, 0.3, 0.\bar{3}$

$\uparrow$   
 $= \frac{3}{10}$        $\uparrow$

$0.33333\dots$

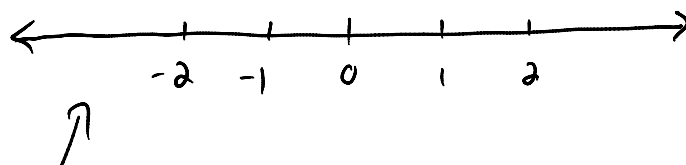
Note: decimals that either repeat or terminate are rational

irrational numbers  $I$

- cannot be written as a ratio of integers

examples:  $\pi, \sqrt{2}, 0.5055005550005555000\dots$

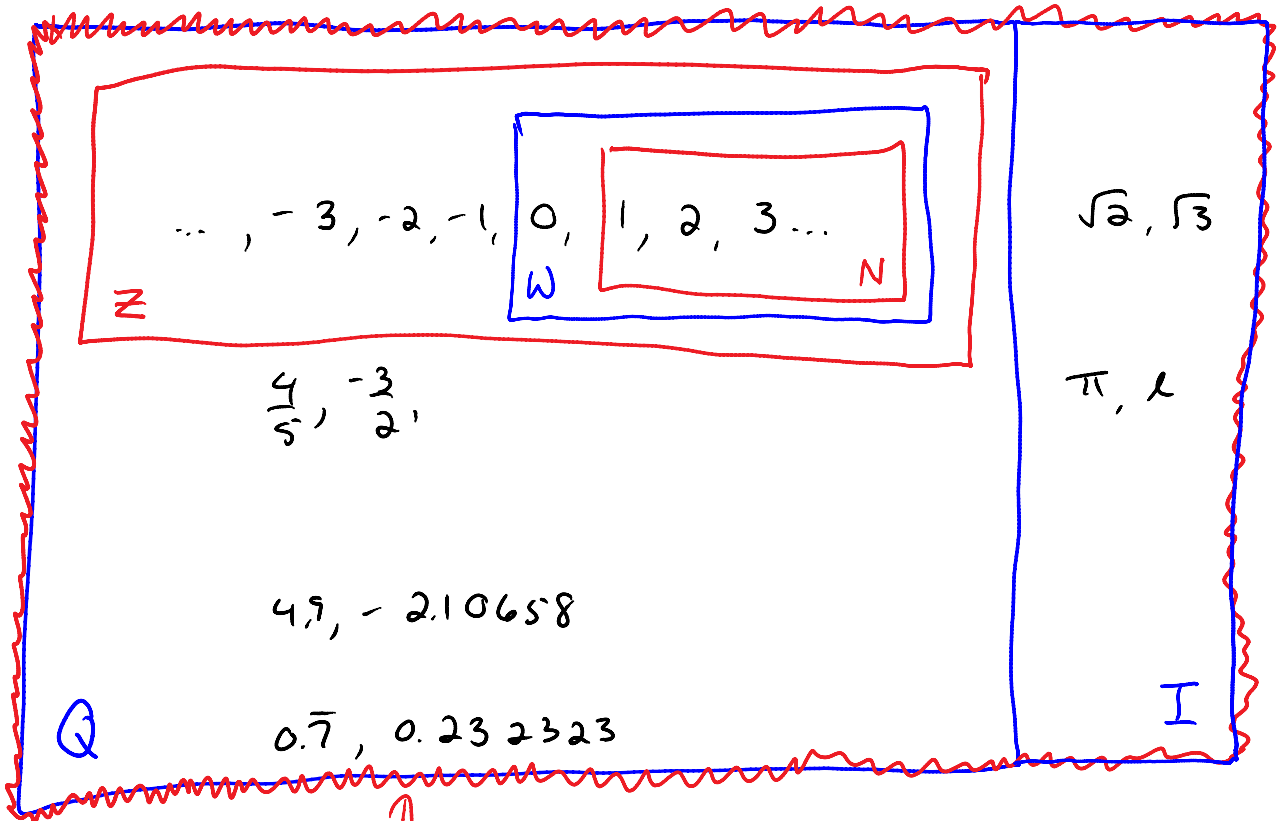
real numbers  $R$  (can be written as  $\mathbb{R}$ )



the real number line

$\uparrow$      -2 -1 0 1 2

$\mathbb{R}$  is the set of points on this line



$\uparrow$   
inside squiggly line is  $\mathbb{R}$