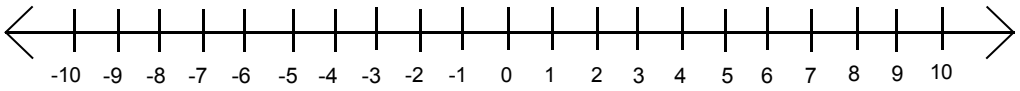
Chapter 9.3
Important sets of numbers



Natural Numbers = { 1,2,3,4...}

Whole Numbers = {0,1,2,3,...}

Integers = {... -2,-1,0,1,2...}

Rational numbers = everything that can be written in the form a/b (fraction) where b≠o

In set building notation it is written as
R = {a/b : a & b are integers and b ≠ 0}

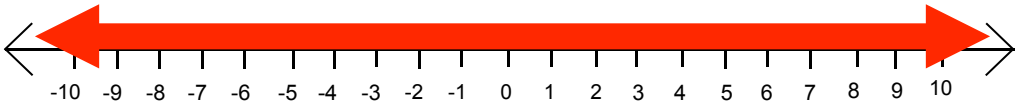
Irrational Numbers
Numbers on a number line but not representable by a fraction.

$\sqrt{2}$ $\sqrt{3}$ $2\sqrt{3}$ π

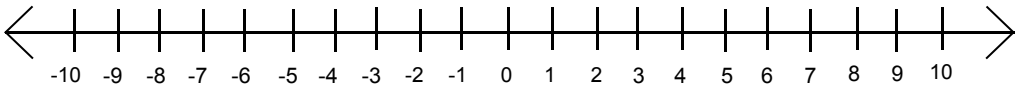
So
Rational #'s $\cap$ irrational #'s

is the null set or empty set. We say these are disjoint sets.

So
Rational #'s $\cup$ irrational #'s
Are called real numbers



Where is $\sqrt{5}$ on the number line?



Write 2.7777... as a fraction.

Let n = 2.777... (multiply each side by 10)

$x = 2.7777\ldots$

$10x = 27.777\ldots$

$10x = 27.7777\ldots$

$-\ (x = 2.7777\ldots)$

$9x = 25$

$\frac{9}{9} \quad \frac{25}{9}$

$x = \frac{25}{9}$

Write 8.7575757... as a fraction.

Let n = 8.75757... (multiply each side by 100)

$n = 8.75757575\ldots$

$100n = 875.7575\ldots$

$100n = 875.7575\ldots$

$-\ n = 8.7575\ldots$

$99n = 867$

$\frac{99n}{99} = \frac{867}{99}$

$n = \frac{867}{99}$

Hard Example $x = 2.165656565$

$10x = 21.\overline{65}$ $1000x = 2165.\overline{65}$

$$\begin{array}{r} 1000x = 2165.\overline{65} \\ -10x = \quad 21.\overline{65} \\ \hline 990x = 2144 \end{array}$$

$$\frac{990x}{990} = \frac{2144}{990}$$

$$x = \frac{2144}{990}$$

12a) $x = 0.\overline{15}$

12b) $= -2\frac{456}{1000}$ → reduce this ↙ $-\frac{2456}{1000}$

10 — 17
4
26, 27