

# 5 Rational Numbers

September 19, 2021 6:33 PM

Math 9

Name: \_\_\_\_\_

Ch 3 Day 5: Rational Numbers

Page 1 of 2

**Recall: Integers and Decimal Numbers**

Definition of a Rational Number

Any number that can be written in the form  $\frac{m}{n}$   
where m and n are integers and  $n \neq 0$

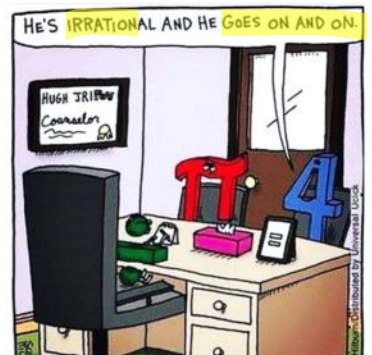
Numbers that **cannot** be written as fractions are called  
irrational.

The most famous irrational numbers are:

$\pi$



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 1^2 + 1^2 &= c^2 \\ 1 + 1 &= c^2 \\ \sqrt{2} &= \sqrt{c^2} \\ c &= \sqrt{2} \end{aligned}$$



About Repeating Decimals:

$$\begin{aligned} 0.\overline{7} &= 0.777... \\ &= \frac{7}{9} \end{aligned}$$

$$8.\overline{5} = 8\frac{5}{9}$$

$$0.\overline{23} = \frac{23}{99}$$

$$\begin{array}{r} 0.77... \\ 9 \overline{) 7.00} \\ \underline{- 63} \phantom{0} \\ 70 \end{array}$$

Your examples:

$$0.\overline{6} = \frac{6 \div 3}{9 \div 3} = \frac{2}{3}$$

$$\begin{aligned} 0.\overline{37} \\ &= \frac{37}{99} \end{aligned}$$

The following can be written as fractions, therefore they are rational numbers:

Integers

$$\begin{aligned} \frac{5}{1} \quad \checkmark \\ \frac{10}{2} \end{aligned}$$

Terminating Decimals

$$0.5 = \frac{5}{10} = \frac{1}{2} \quad \checkmark$$

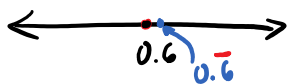
$$0.25 = \frac{25}{100} = \frac{1}{4}$$

Repeating Decimals

$$0.\overline{5} = \frac{5}{9} \quad \checkmark$$

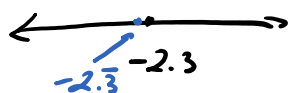
Ms. Kamber

Comparing **Repeating Decimals** and **Terminating Decimals**:



$$0.\overline{6} > 0.6$$

$$0.666... \quad 0.600...$$



$$-2.\overline{3} < -2.3$$

$$-2.333... \quad -2.300...$$

Which is bigger: 0.3 or  $0.\overline{3}$ ?

$-0.\overline{7}$  or  $-0.7$ ?

Your examples:

$$0.5 < 0.\overline{5}$$

### Assignment:

- Sec 3.1 (Rational Numbers), p.100: ★ 3, 5, 6

- Mid-Unit Review, p. 121 ★ 5a, b i, ii, iv, vi; 8a, b

★★ 7, 9, 10a, b i, ii

- Study for Quiz on adding, subtracting, multiplying, and dividing decimal numbers!

$$\frac{-2}{5} = \frac{2}{-5} = -\frac{2}{5}$$

all negative

$$vs. \frac{-2}{-5} = \frac{2}{5}$$

vs positive!

### Common Decimals as Fractions

$$0.25 = \frac{1}{4}$$

$$0.\overline{3} = \frac{3}{9} = \frac{1}{3}$$

$$0.1 = \frac{1}{10}$$

$$0.5 = \frac{1}{2}$$

$$0.\overline{6} = \frac{6}{9} = \frac{2}{3}$$

$$0.75 = \frac{3}{4}$$