

# 10 Comparing Rational Numbers

October 23, 2019 9:53 PM

Math 9

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

Ch 3 Day 10: Comparing Rational Numbers

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## What is a rational number?

Any number that can be written in the form  $\frac{m}{n}$  (a fraction!)

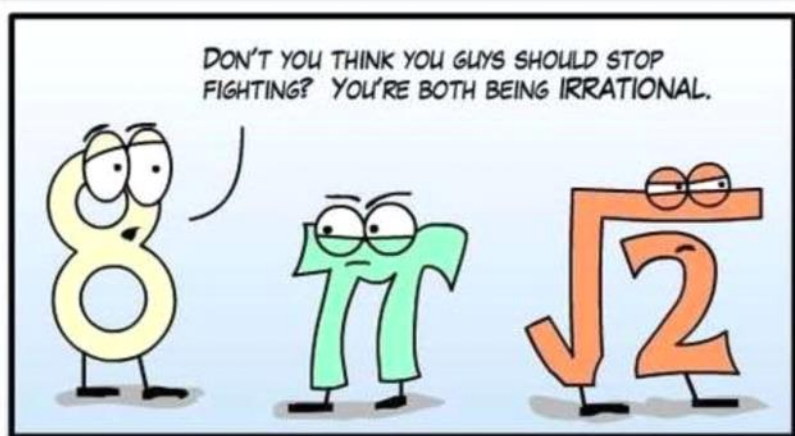
where m and n are integers and  $n \neq 0$

Rational #

$$\begin{aligned} 8 &= \frac{8}{1} \\ 0.7 &= \frac{7}{10} \\ 0.\overline{7} &= \frac{7}{9} \end{aligned}$$

$$7\frac{3}{10} = \frac{73}{10}$$

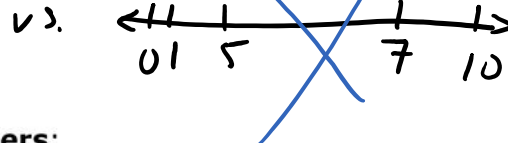
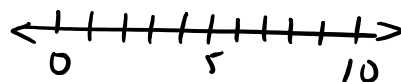
$$\frac{2}{1}$$



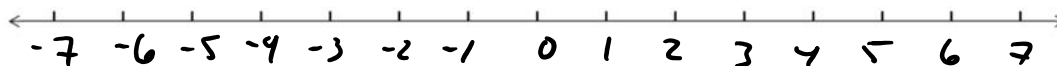
Irrationals

$$\pi, \sqrt{2}, \sqrt{3}, \sqrt{4} = 2$$

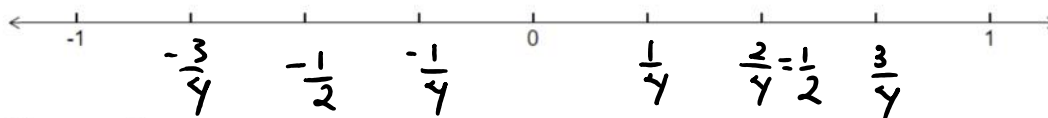
When you draw a number line, make sure the tick marks are evenly spaced!



Label the number line below using integers:



Label the number line below using fractions:  $\frac{1}{4}$ , fourths



Place value:

Hundreds tens ones decimal tenths hundredth thousandths

7 3 1 . 8 9 5

To get **equivalent fractions**:

Multiply the **numerator** and **denominator** by the **SAME** number, e.g., 2.

$$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}, \text{ so } \frac{3}{4} \text{ and } \frac{6}{8} \text{ are equivalent.}$$

**Common Fractions:**

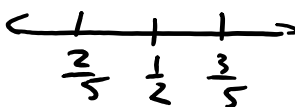
$$\begin{array}{lll} 0.25 = \frac{1}{4} & 0.75 = \frac{3}{4} & \frac{1}{3} = 0.\bar{3} = \frac{3}{9} \\ 0.5 = \frac{1}{2} & \frac{1}{10} = 0.1 & \frac{2}{3} = 0.\bar{6} \end{array}$$

**Finding a number between "close fractions"** like  $\frac{2}{5}$  and  $\frac{3}{5}$ :

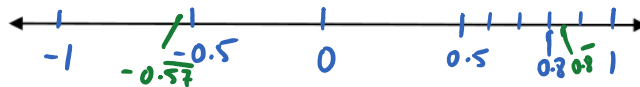
A strategy is to find *equivalent* fractions for each, and then find a fraction in between.

$$\begin{array}{l} \frac{2}{5} \times \frac{2}{2} = \frac{4}{10} \\ \frac{3}{5} \times \frac{2}{2} = \frac{6}{10} \end{array} \quad \begin{array}{l} \frac{2}{5} \times \frac{3}{3} = \frac{6}{15} \\ \frac{3}{5} \times \frac{3}{3} = \frac{9}{15} \end{array} \quad \begin{array}{l} \frac{2}{5} \times \frac{4}{4} = \frac{8}{20} \\ \frac{3}{5} \times \frac{4}{4} = \frac{12}{20} \end{array}$$

in between  $\frac{5}{10} = \frac{1}{2}$



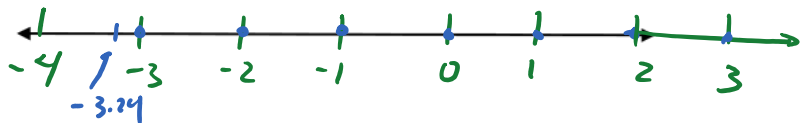
**Ex. 1:** Put these on a number line: 0.8,  $0.\bar{8}$ , -0.5,  $-0.\bar{5}$



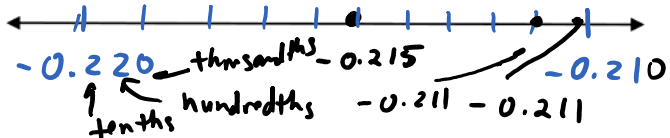
**Ex. 2: Find 3 rational numbers between each pair of numbers:**

a) 2.65 and -3.24

$$\begin{array}{l} -3, -1 \\ 0, 0.5 \end{array}$$

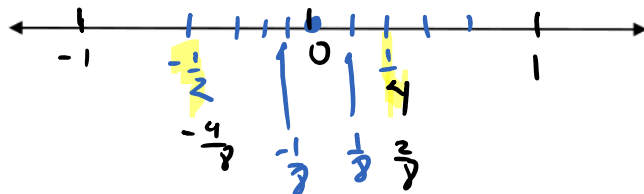


b) -0.21 and -0.22



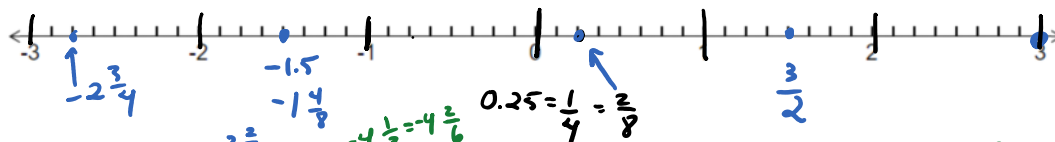
c)  $-\frac{1}{2}$  and  $\frac{1}{4} = \frac{2}{8}$

$$-\frac{1}{2} \times \frac{4}{4} = -\frac{4}{8}$$

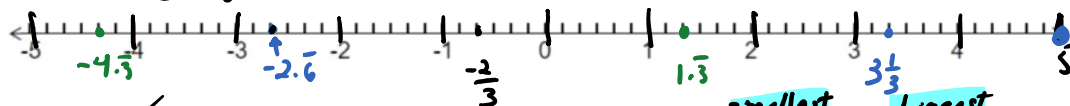


**Ex. 3:** Graph the following rational numbers on the number line.

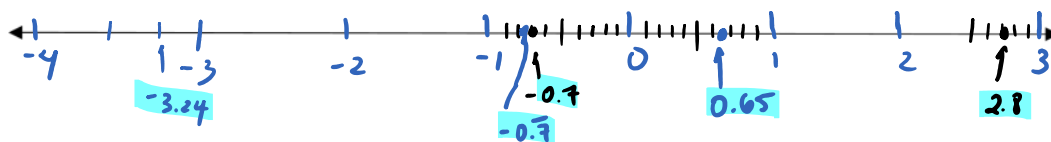
a)  $3, 0.25, 1.5, -2\frac{3}{4}, -2\frac{6}{8}$   $1 \text{ unit} = 8 \text{ ticks}$



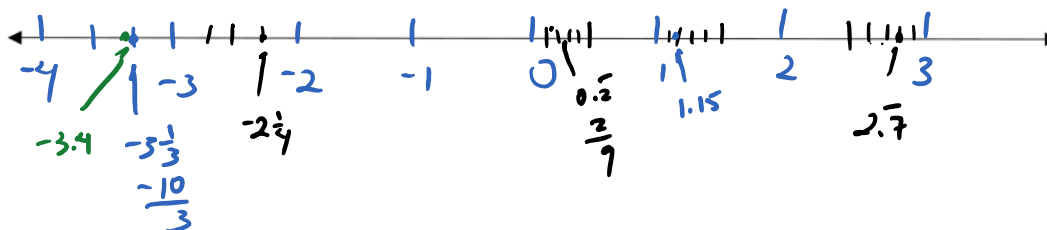
b)  $5, \frac{2}{3}, 2\frac{2}{3}, 1\frac{3}{3}, -4\frac{3}{3}, -2.\bar{6}$   $6 \text{ ticks} \rightarrow 1 \text{ tick} = \frac{1}{6}$   $1.\bar{3} = 1\frac{1}{3} = 1\frac{2}{6}$



c)  $0.65, 2.8, -0.7, -3.24, -0.7$  **Order from least to greatest**  $\rightarrow$  **Put integers on 1st!** **smallest** **biggest**



d)  $1.15, -\frac{10}{3}, -3.4, 2\frac{2}{3}, -2\frac{1}{4}$   $6 \text{ ticks} \rightarrow 1 \text{ tick} = \frac{1}{6}$



### Assignment:

Sec 3.1, p.101: ★ 8ad, 9 ad, 10abc, 12acg

★★ 14ac, 16-18, 23bcd, 24bc, 25

★★★ 14h, 22