

# Math 9 Section 3.1/3.2 - Rational Numbers Review

Homework: Section 3.1 on Pg. 90; #1all, 2-9half  
Section 3.2 on Pg. 97; #1half, 4half, 6-7half, 9-13

**Rational Numbers:** Any number that can be written as

a fraction or terminating/repeating decimals

For example:  $\frac{3}{7}$ ,  $-\frac{17}{3}$ ,  $3\frac{4}{15}$ ,  $0.45$ ,  $-2.3\overline{7}$ ,  $1.523418712\dots$

**Denominator:**

- Bottom of fraction
- total number of pieces in the whole



**Numerator:**

- top of fraction
- number of pieces we have (colored in)

**Simple Fractions:**

- Numerator (top) smaller than denominator (bottom)

$$\frac{3}{4}, \frac{3}{5}, \frac{10}{12}$$

**Improper Fractions:**

- Numerator is bigger than denominator

$$\frac{17}{3}, \frac{-8}{7}, \frac{5}{4}$$

**Mixed Fractions:**

- Integer next to simple fraction

$$3\frac{1}{2} = 3 + \frac{1}{2}$$

$$-4\frac{2}{10} = -(4 + \frac{2}{10}) = -4 - \frac{2}{10}$$

**Fractions to Decimals:**

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

$$\frac{8}{3} = 8 \div 3 = 2.666\dots = 2.\overline{6}$$

$$2\frac{3}{7} = \frac{2 \cdot 7 + 3}{7} = \frac{17}{7}$$

$$= \frac{3}{7} + 2 = 2.428571428571428571$$

$$= 2.\overline{428571}$$

**Terminating Decimals to Fractions:**

$$\frac{155}{100} = \frac{155}{10^2}$$

move back 2 times 2 zeros

$$\frac{0.3147}{1} = \frac{3147}{10000}$$

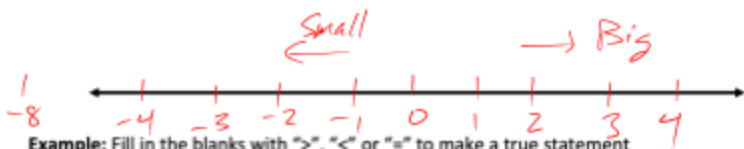
4 zeros

$$\frac{23765}{1000} = \frac{23765}{10^3}$$

3 zeros

Repeating decimals to fractions is possible, but a bit more complicated...

$$0.\overline{2} = \frac{2}{9} \Rightarrow 0.\overline{23} = \frac{23}{99} \Rightarrow 0.\overline{234} = \frac{234}{999}$$



**Example:** Fill in the blanks with ">", "<" or "=" to make a true statement

$4 > -8$

my eats the bigger one

$-5 > -10$

$-10 < 0$

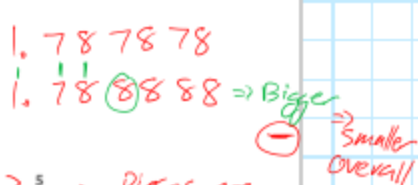
$1.7 < 1.8$



$1.777 < 1.7$



$-1.78 > -1.78$



$\frac{5}{12} < \frac{7}{12}$

5 of 12      7 of 12



$-1\frac{4}{9} < -1\frac{2}{9}$

↑  
Smaller  
⊖  
↓  
Bigger  
Overall

$\frac{2}{3} > \frac{5}{8}$  → pieces are different size

① Decimal

$\frac{2}{3} = 0.666\dots$        $\frac{5}{8} = 0.625$

② Common denominator

$\frac{2 \cdot 8}{3 \cdot 8} = \frac{16}{24}$        $\frac{5 \cdot 3}{8 \cdot 3} = \frac{15}{24}$

**Challenge:** For each pair of numbers, find a fraction and a decimal between the two numbers

$\frac{7}{10}$  and  $\frac{8}{9}$

$$\frac{7 \cdot 9}{10 \cdot 9} = \frac{63}{90}$$

$$\frac{8 \cdot 10}{9 \cdot 10} = \frac{80}{90}$$

←  $\frac{70}{90} = 0.777\dots$   
 $0.\bar{7}$

↓  
 $\frac{7}{9}$   
1

$-2.35$  and  $-2.40$

$$-2.\overset{37}{\underset{2}{\quad}} = -\frac{237}{100}$$

↑  
2 zeros