

## Rational Numbers

What does it mean to be a rational number?

a number that can be written  
as a quotient of two integers.  
(division)

Show that the number is a rational number by writing it as a quotient of two integers.

1)  $9 = \frac{9}{1} = \frac{-18}{-2} = \frac{900}{100}$     2)  $-10 = \frac{-10}{1} = \frac{80}{-8} = \frac{-200}{20}$     3)  $8\frac{4}{5} \rightarrow \frac{44}{5}$

## Writing Fractions as Decimals

Method #1 – When the denominator is already a power of 10. Use place value.

1)  $\frac{3}{10} = .3$  (tenths)    2)  $\frac{5}{100} = .05$  (hundredths)    3)  $\frac{1255}{1000} = 1.2555$  (improper, greater than one)

Method #2 – When you can get the denominator to be a power of 10 by writing an equivalent fraction. Make equivalent fraction, then use place value.

4)  $\frac{4}{5} = \frac{8}{10} = .8$     5)  $\frac{13}{20} = \frac{65}{100} = .65$     6)  $\frac{3}{8} = \frac{125}{1000} = .125$

Method #3 – When the denominator cannot be made into a power of 10. Use long division.

7)  $\frac{5}{11} = .\overline{45}$   

$$\begin{array}{r} 0.45 \\ 11 \overline{) 5.000} \\ \underline{-44} \phantom{00} \\ 60 \phantom{0} \\ \underline{-55} \phantom{0} \\ 40 \end{array}$$

8)  $-\frac{2}{3} = -.\overline{6}$   

$$\begin{array}{r} .6 \\ 3 \overline{) 2.000} \\ \underline{-18} \phantom{00} \\ 20 \phantom{0} \\ \underline{-18} \phantom{0} \\ 2 \end{array}$$

9)  $\frac{1}{6} = .\overline{16}$   

$$\begin{array}{r} .166 \\ 6 \overline{) 1.000} \\ \underline{-6} \phantom{00} \\ 40 \phantom{0} \\ \underline{-36} \phantom{0} \\ 40 \end{array}$$

Terminating Decimal: Have a definite end. (ex) .5 4.3 100.75

Repeating Decimal: Have digits that go on (repeat) forever (ex)  $\overline{.3}$   $76.\overline{76}$

Can I tell if a number is rational by looking at the decimal?

**Writing Decimals as Fractions** \* Always reduce!

1) 0.7  $\frac{7}{10}$

2) -3.05  $-3\frac{5}{100} = \boxed{-3\frac{1}{20}}$

3)  $0.\overline{93}$

$$\begin{array}{r} 100x = 93.\overline{93} \\ - \quad x = \quad \overline{.93} \\ \hline 99x = 93 \end{array}$$

$x = \frac{93}{99} = \boxed{\frac{31}{33}}$

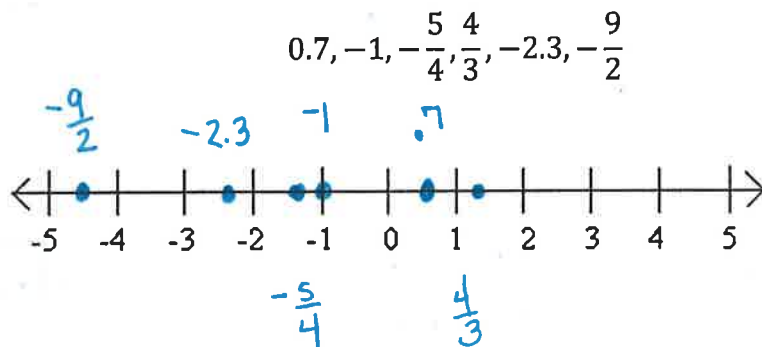
4)  $1.\overline{45}$

$$\begin{array}{r} 100x = 45.\overline{45} \\ - \quad x = \quad \overline{.45} \\ \hline 99x = 45 \end{array}$$

$x = \frac{45}{99} = \frac{5}{11}$

$\boxed{\frac{15}{11}}$

**Ordering Rational Numbers**



**Homework: p. 222 #6-17, 20-44 (evens), 59, 60**

Adapted: p. 222 #6, 7, 10, 11, 14, 15, 20, 24, 28, 32, 36, 38, 40, 59