

**SEPTEMBER 16, 2015**

**UNIT 1: RATIONAL NUMBERS**

**SECTION 3.1:  
WHAT IS A RATIONAL  
NUMBER?**

**M. MALTBY INGERSOLL**  
*MATH 9*



## **WHAT'S THE POINT OF TODAY'S LESSON?**

**We will continue working on the Math 9 Specific Curriculum Outcome (SCO) "Numbers 3" OR "N3" which states:**

**"Demonstrate an understanding of rational numbers by: comparing and ordering rational numbers; solving problems that involve arithmetic operations on rational numbers."**



## What does **THAT** mean???

**SCO N3 means that we will compare and order (largest vs smallest), add, subtract, multiply and divide fractions and any numbers that can be written as fractions. For example, sometimes we will work with  $\frac{1}{2}$  or 0.5. We have to know how to work with both.**



## HOMWORK QUESTIONS???

(page 101, #5, #6 and #7)

$$6. a) \frac{7}{-9}$$

$$= \frac{-7}{9}$$

$$= -\frac{7}{9}$$

$$= \frac{14}{-18}$$

## HOMWORK QUESTIONS???

(page 101, #5, #6 and #7)

$$7. d) -\frac{11}{6}$$
$$= -1.\overline{83}$$

**EQUIVALENT FRACTIONS:**

**Example:**  $\frac{1}{2} = \frac{5}{10} = \frac{4}{8} = \frac{3}{6}$

**To form equivalent fractions, you multiply or divide the numerator and denominator of the original fraction by the same number.**

**Example:**  $\frac{40}{52} = \frac{20}{26} = \frac{10}{13}$

## REDUCING FRACTIONS TO LOWEST TERMS:

Example:  $\frac{15}{24} \stackrel{\div 3}{=} \frac{5}{8}$

15: 1, 3, 5, 15  
24: 1, 2, 3, 4, 6, 8, 12, 24  
GCF = 3

To reduce fractions to lowest terms, we find the **GCF** (**greatest common factor**) of the numerator and denominator, then divide them both by this GCF. You know that your fraction is in lowest terms when the only GCF you can find is 1.

## EXPRESSING DECIMAL NUMBERS AS FRACTIONS:

### TERMINATING DECIMAL NUMBERS:

Examples:  $0.4 = \frac{4}{10}$   
 $= \frac{2}{5}$

$$0.27 = \frac{27}{100}$$

$$\begin{aligned} 0.375 &= \frac{375}{1000} \begin{array}{l} \div 25 \\ \div 25 \end{array} \\ &= \frac{15}{40} \begin{array}{l} \div 5 \\ \div 5 \end{array} \\ &= \frac{3}{8} \end{aligned}$$

$$\begin{aligned} 3.9 &= 3 \frac{9}{10} \\ &= \frac{39}{10} \end{aligned}$$

$$\text{GCF} = 125$$



## EXPRESSING DECIMAL NUMBERS AS FRACTIONS:

### REPEATING DECIMAL NUMBERS:

Examples:  $0.\overline{4} = \frac{4}{9}$

$$0.\overline{27} = \frac{27}{99} = \frac{3}{11}$$

$$0.\overline{375} = \frac{375}{999} = \frac{125}{333}$$

$$2.1\overline{2} = 2 + \frac{10}{9}$$

## IMPROPER FRACTIONS AND MIXED NUMBERS:

An improper fraction has a numerator that is greater than its denominator. It can be changed to a mixed number.

Example:  $\frac{9}{4} = 2 \frac{1}{4}$

## IMPROPER FRACTIONS AND MIXED NUMBERS:

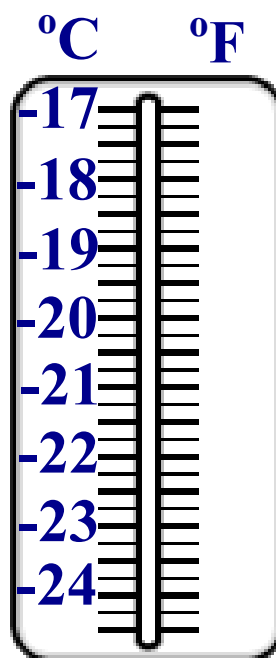
A mixed number has a larger number to the left of a fraction. It can be changed to an improper fraction. This is what you must do if you are asked to express mixed numbers in the form  $\frac{a}{b}$ .

Examples:

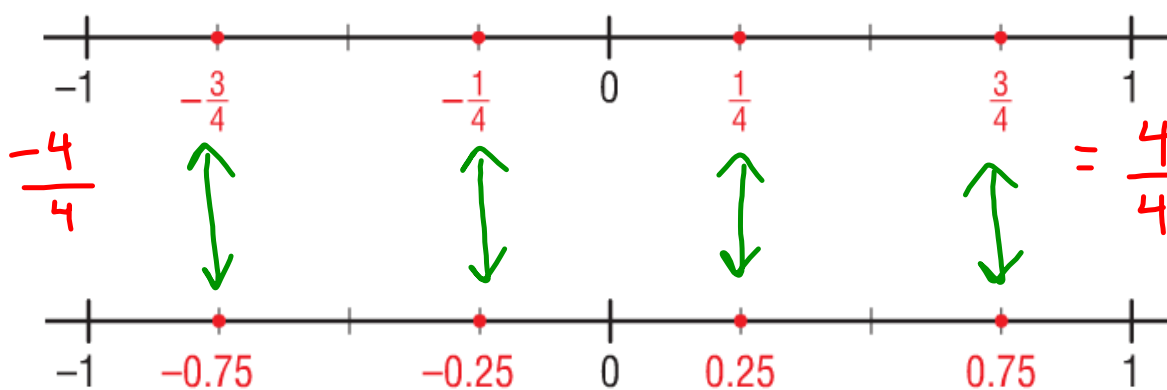
$$2\frac{1}{4} = \frac{9}{4} \quad \left. \begin{array}{l} -4\frac{2}{5} = -\frac{22}{5} \\ -4.4 \\ -4.4 \end{array} \right\}$$

~~$\frac{-18}{5} = -3.6$~~

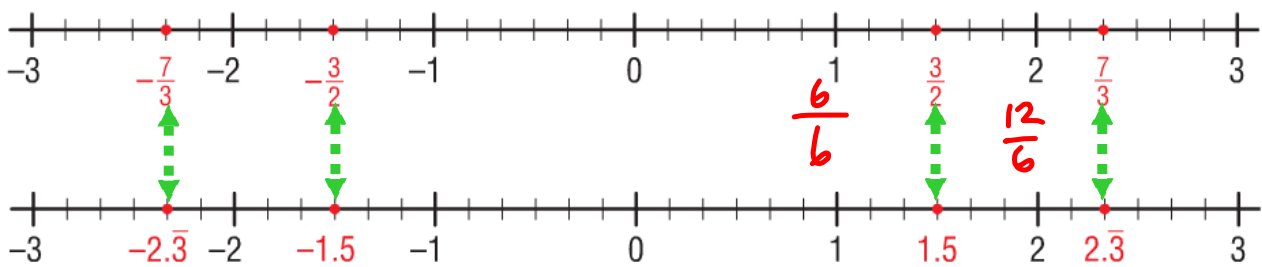
**PLEASE TURN TO PAGE 94 IN *MMS9*.**



**PLEASE TURN TO PAGE 95 IN *MMS9*.**

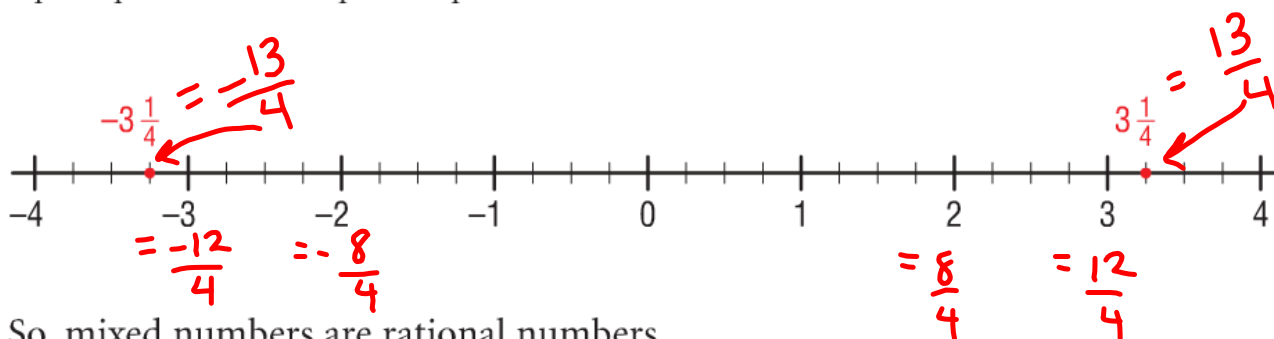


**PLEASE TURN TO PAGE 96 IN *MMS9*.**  
**Rational numbers can be written in many ways,  
including fractions, terminating decimal  
numbers, and repeating decimal numbers.**



Any mixed number can be written as an improper fraction:

$$3\frac{1}{4} = \frac{13}{4} \quad \text{and} \quad -3\frac{1}{4} = -\frac{13}{4}$$



So, mixed numbers are rational numbers.

## CONCEPT REINFORCEMENT

***MMS9:***

**PAGE 101: #8, #9, #10, #11 & #12abgh (no  
number lines)**