

**SEPTEMBER 28, 2015**

**UNIT 1: RATIONAL NUMBERS**

**SECTION 3.5:  
DIVIDING RATIONAL  
NUMBERS**

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*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.**



# WARM UP:



Determine each product.

$$\text{a) } 3.5 \times (-0.3)$$

$$= -1.05$$

$$\text{c) } \left(-\frac{4}{7}\right)\left(-\frac{2}{3}\right)$$

$$= \frac{8}{21}$$

$$\text{b) } (-4.1)(2.3)$$

$$= -9.43$$

$$\text{d) } 1\frac{3}{5} \times \left(-2\frac{1}{2}\right)$$

$$= \frac{8}{5} \times \frac{-5}{2}$$

$$= -4$$

**HOMEWORK QUESTIONS???**

(pages 127 / 128 / 129, #6, 7, 9 TO 12, 14 & 15)

$$12. c) \left(-2\frac{8}{9}\right)\left(5\frac{1}{8}\right)$$

$$= \frac{-26}{9} \left(\frac{41}{8}\right)$$

$$= \frac{-533}{36}$$

$$= -14\frac{29}{36}$$

**HOMEWORK QUESTIONS???****(pages 127 / 128 / 129, #6, 7, 9 TO 12, 14 & 15)**

$$14. a) \quad \$3457.25 \times 25$$

$$= \$ 86\,431.25$$

$$b) \quad \$ 45\,567.87$$

$$- \$ 86\,431.25$$

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$$- \$ 40\,860.38$$

**HOMEWORK QUESTIONS???****(pages 127 / 128 / 129, #6, 7, 9 TO 12, 14 & 15)**

$$15. b) \begin{pmatrix} 5 \\ \cancel{6} \end{pmatrix} \begin{pmatrix} \cancel{4} \\ 7 \end{pmatrix} \begin{pmatrix} \cancel{3} \\ \cancel{2} \end{pmatrix}$$

Handwritten annotations: A blue '-2' and a blue '-1' are written above the second fraction. A blue checkmark is next to the '5' in the first fraction. A green checkmark is next to the '6' in the first fraction. A green checkmark is next to the '3' in the third fraction. A red checkmark is next to the '2' in the third fraction. A blue checkmark is next to the '7' in the second fraction.

$$= \frac{-5}{7}$$

$$\frac{-60}{84} \begin{array}{l} \div 12 \\ \div 12 \end{array}$$

## **SECTION 3.5: DIVIDING RATIONAL NUMBERS**

### **THE SIGN RULES FOR DIVIDING RATIONAL NUMBERS:**

$$(+) \div (+) = +$$

$$(-) \div (-) = +$$

$$(+) \div (-) = -$$

$$(-) \div (+) = -$$



**EXAMPLES:**

$$1) \quad (-1.38) \div 0.6 \\ = -2.3$$

$$2) \quad (-0.25) \div (-0.3) \\ = 0.\overline{83}$$

**EXAMPLES:**

$$\begin{aligned} 3) \quad & \left( \frac{-5}{8} \right) \div \frac{3}{4} && \text{Lcm} = 8 \\ & = \left( \frac{-5}{8} \right) \div \frac{6}{8} && \text{(common denominator)} \\ & = \frac{-5}{6} && \text{(divide numerators)} \end{aligned}$$

## **DIVIDING RATIONAL NUMBERS IN FRACTION FORM:**

**To divide fractions, multiply the first fraction (the "dividend") by the reciprocal of the second fraction (the "divisor"). If there are more than two fractions, work from left to right. Reduce answers where necessary.**

## RECIPROCAL:

Two numbers whose product is always +1. Basically, turn the fraction upside down.

**Example:**  $\frac{2}{3}$  and  $\frac{3}{2}$

$$\left(\frac{2}{3}\right)\left(\frac{3}{2}\right) = 1$$

$$\left(\frac{-2}{3}\right)\left(\frac{3}{-2}\right) = 1$$

**EXAMPLES:**

$$\begin{aligned} 3) \quad & \left( \frac{-5}{8} \right) \div \frac{3}{4} \\ & = \left( \frac{-5}{8} \right) \times \frac{4}{3} \\ & = \frac{-5}{6} \end{aligned}$$

*Handwritten notes:*

- A red circle around the division symbol ( $\div$ ) in the first line.
- A red arrow pointing from the circled  $\div$  to the  $\times$  in the second line.
- A red arrow pointing from the circled  $\div$  to the word "reciprocal" written in red cursive.
- A red line striking through the  $\frac{4}{3}$  in the second line.
- A red number "2" written below the  $\frac{-5}{8}$  in the second line.

**EXAMPLES:**

$$\begin{aligned} 4) \quad & \left(-4\frac{1}{5}\right) \div \left(-3\frac{1}{3}\right) && \text{METHOD 1} \\ & = \left(\frac{-21}{5}\right) \div \left(\frac{-10}{3}\right) && \text{LCM} = 15 \\ & = \left(\frac{-63}{15}\right) \div \left(\frac{-50}{15}\right) \\ & = \frac{-63}{-50} \\ & = 1\frac{13}{50} \end{aligned}$$

**EXAMPLES:**

$$\begin{aligned} 4) \quad & \left(-4\frac{1}{5}\right) \div \left(-3\frac{1}{3}\right) && \text{METHOD 2} \\ & = \left(\frac{-21}{5}\right) \div \left(\frac{-10}{3}\right) \\ & = \left(\frac{-21}{5}\right) \times \left(\frac{-3}{10}\right) \\ & = \frac{63}{50} \\ & = 1\frac{13}{50} \end{aligned}$$

## **CONCEPT REINFORCEMENT:**

### ***MMS9:***

**Page 134: #3 & #4**

**Page 135: #6 ("mean"="avg."), #8, #11 & #12**

**Page 136: #15**