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UNIT 1:   RATIONAL NUMBERS

SECTION 3.6:
ORDER OF OPERATIONS
WITH RATIONAL
NUMBERS

K. Sears
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" and also explore SCO "Numbers 4" OR "N4". They state:

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

AND

"Explain and apply the order of operations, including exponents, with and without technology."

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 1/2 or 0.5. We have to know how to work with both.

　　　SCO N4 means that we will work with rational numbers, especially fractions, without using calculators.

WARM UP:

Determine each quotient.

a) $8.4 \div (-1.2)$

b) $(-20.6) \div (-0.9)$

c) $\left(-\dfrac{9}{11}\right) \div \left(\dfrac{7}{5}\right)$

d) $\left(-1\dfrac{2}{3}\right) \div 3\dfrac{1}{2}$

WARM UP: (TO BE PASSED IN)

Evaluate. Use fractions for #2 and #4.

1. $(-5.6) - (-7.7)$	**2.** $1\frac{2}{9} + \left(-\frac{5}{4}\right)$
3. -7.3×-9.3	**4.** $-2\frac{1}{3} \div \left(-\frac{9}{2}\right)$

HOMEWORK QUESTIONS?
("Extra Practice 3" / "Extra Practice 4")

SECTION 3.6:   ORDER OF OPERATIONS WITH RATIONAL NUMBERS

What does BEDMAS stands for?

B: Brackets
E: Exponents
D: Division
M:Multiplication
A: Addition
S: Subtraction

EXAMPLES:

1) $(-0.8) + 1.2 \div (-0.3) \times 1.5$
   $= (-0.8) + (-4) \times 1.5$
   $= (-0.8) + (-6)$
   $= (-0.8) - 6$
   $= -6.8$

EXAMPLES:

2) $(-3.2) - 0.9 \div [\ 0.7 - (-1.2)\ ]^2$

$= (-3.2) - 0.9 \div (0.7 + 1.2)^2$

$= (-3.2) - 0.9 \div (1.9)^2$

$= (-3.2) - 0.9 \div 3.61$

$\doteq (-3.2) - 0.2493...$

$\doteq -3.4493...$

$\doteq -3.4$

EXAMPLES:

3) In Fort Simpson, Northwest Territories, the mean temperature in December is -9.4 degrees Fahrenheit. What is this temperature in degrees Celsius?

To convert a temperatue in degrees Fahrenheit to degrees Celsius, we use the formula:

$$C = \frac{F - 32}{1.8}$$

$$= \frac{-9.4 - 32}{1.8}$$

$$= \frac{-41.4}{1.8}$$

$$= -23$$

The mean temperature in December is -23°C.

EXAMPLES:

4) $\dfrac{2}{3} \div \left[\dfrac{3}{4} + \left(-\dfrac{1}{2}\right)\right] \times \dfrac{1}{3}$

$= \dfrac{2}{3} \div \left(\dfrac{3}{4} - \dfrac{2}{4}\right) \times \dfrac{1}{3}$

$= \dfrac{2}{3} \div \dfrac{1}{4} \times \dfrac{1}{3}$

$= \dfrac{2}{3} \times \dfrac{4}{1} \times \dfrac{1}{3}$

$= \dfrac{8}{9}$

EXAMPLES:

5) $\left(-\dfrac{1}{2}\right)\left(-\dfrac{1}{2}\right) \; - \; \left(-\dfrac{2}{3}\right) \; \div \; \left[\dfrac{1}{3} \; + \; \left(-\dfrac{3}{12}\right)\right]$

$= \; \dfrac{1}{4} \; + \; \dfrac{2}{3} \; \div \; \left(\dfrac{4}{12} \; - \; \dfrac{3}{12}\right)$

$= \; \dfrac{1}{4} \; + \; \dfrac{2}{3} \; \div \; \dfrac{1}{12}$

$= \; \dfrac{1}{4} \; + \; \dfrac{2}{3} \; \times \; \dfrac{12}{1}$

$= \; \dfrac{1}{4} \; + \; 8$

$= \; 8\dfrac{1}{4}$

CONCEPT REINFORCEMENT:

MMS9:

Page 140:   #4, 5, 7, and 8
Page 141:   #9, 10, 11, 12, 13 and 14 (ALL)
Page 142:   #16, 17, and 18(a)

Order of operations..

$(10 + 2 - 5) \times (6^2 \div (8 - 4))$

$= 7 \times (6^2 \div 4)$

$= 7 \times (36 \div 4)$

$= 7 \times 9$

$= 63$

$10 + 8 - 6^2 \div (3^2 \times 4)$

$= 10 + 8 - 6^2 \div (9 \times 4)$

$= 10 + 8 - 6^2 \div 36$

$= 10 + 8 - 36 \div 36$

$= 10 + 8 - 1$

$= 17$

Worksheet #1

$$\left(\frac{4}{9}\right)^2 \div \left(-\frac{4}{5}\right) - \frac{2}{3}$$

$$\left(\frac{3}{4}\right)^3 \times \frac{5}{9} - \frac{7}{8}$$

$$\left(-\frac{7}{8}\right) \times \left(\frac{4}{5} - \left(\frac{2}{3}\right)^2\right)$$

$$\left(\frac{2}{3}\right)^2 \times \left(-\frac{7}{8}\right) + \left(-\frac{2}{5}\right)$$

$$\left(\left(-\frac{1}{3}\right)-\frac{5}{6}\right)^{2}\div\left(-\frac{5}{9}\right)$$

$$\left(-\frac{8}{9}\right)+\frac{1}{9}\div\left(-\frac{1}{4}\right)^{3}$$

Worksheet #2

$$\left(-\frac{1}{2}\right)^3 \times \left(\left(-\frac{2}{3}\right) \div \left(-\frac{5}{6}\right) - \frac{1}{2}\right)$$

$$\left(\frac{2}{3}\right)^2 \times \left(\frac{5}{6} \div \frac{2}{5} - \frac{1}{4}\right)$$

$$\left(\left(-\frac{3}{5}\right)\times\left(\frac{1}{2}\right)^{2}\right)\div\left(\left(-\frac{1}{8}\right)+\frac{3}{5}\right)$$

$$\left(\left(-\frac{1}{5}\right)^{2}-\frac{2}{5}+\frac{1}{5}\right)\times\left(-\frac{7}{8}\right)$$

UNIT 3 - TEST PREPARATION:

Page 143:   **Study Guide (Unit 3)**
Page 144:   **#1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 12**
Page 145:   **#14, 19, 21, 22, and 23**
Page 146:   **ALL!**

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UNIT 1 NON-CALCULATOR SAMPLE QUESTIONS:

These are sample questions similar to ones that COULD be on the non-calculator portion of your January exam:

Page 149:   #19b (just arrange in ascending order - no number line required); #22fh ; #23ad