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UNIT 1:   RATIONAL NUMBERS

SECTION 3.2:
ADDING RATIONAL
NUMBERS

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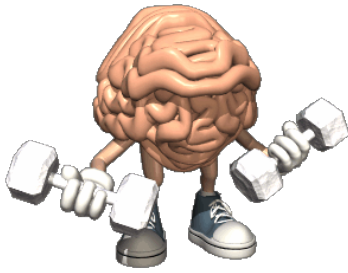
Warm Up

1) Identify whether the number is rational or irrational:

a) $\frac{2}{3}$ b) $1.\overline{66}$ c) $1.234567.....$ d) -2.25

Q $Q = 1\frac{66}{99} = 1\frac{2}{3}$ Q $Q = -2\frac{25}{100}$

$= -2\frac{1}{4}$

2) Express each fraction as a decimal number:

a) $\frac{4}{5} = 0.8$ b) $\frac{9}{6} = 1.5$ c) $\frac{3}{11} = 0.\overline{27}$

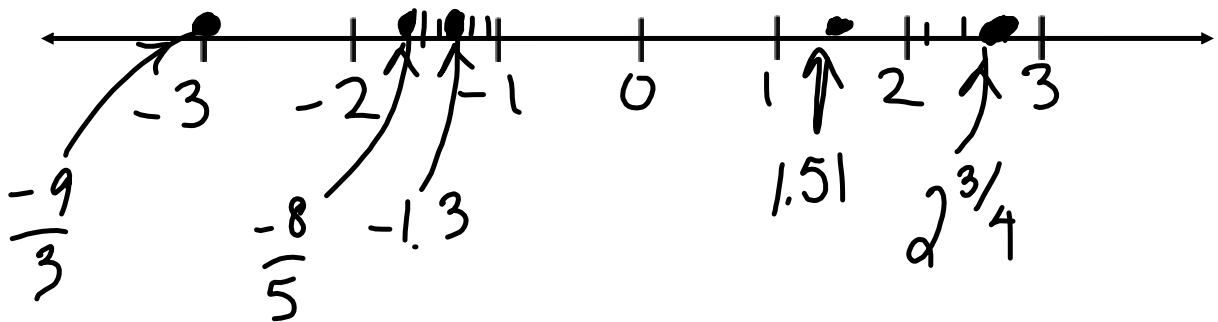3) Express each decimal number as a fraction or mixed number. Reduce if necessary.

a) $0.1 = \frac{1}{10}$ b) $4.75 = 4\frac{75}{100}$ c) $-3.222 = -3\frac{222}{1000}$
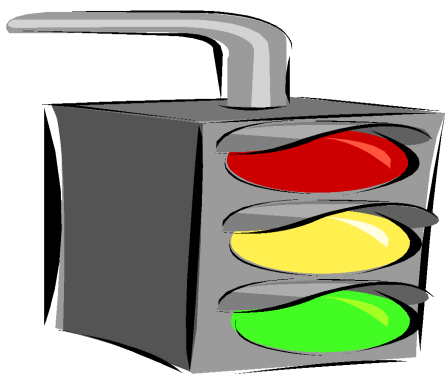
$= 4\frac{3}{4}$ $= -3\frac{111}{500}$

4) Sketch a number line. On the line, place each rational number below.

-1.3, $2\frac{3}{4}$, 1.51, $-\frac{8}{5}$, $-\frac{9}{3}$ $= -3*$

$*$
$(+3)$ $= -1\frac{3}{5}$ $=$

$= -1.6$

$-\frac{9}{3}$ $-\frac{8}{5}$ -1.3 1.51 $2\frac{3}{4}$

Homework:

Questions?

Page 102, #13, #14ae,
#16, #17 & #21

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14. e)

$$\frac{1}{6}$$

$$= \frac{2}{12}$$

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

$$= \frac{1}{4} \quad = \frac{1}{3}$$

$$0.5$$

$$= \frac{5}{10}$$

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

$$= \frac{3}{6}$$

$$= \frac{6}{12}$$

0   1

$\left(\dfrac{0}{12}\right)$ $\frac{2}{12}$ $\frac{3}{12}$ $\frac{4}{12}$ $\frac{5}{12}$ $\frac{6}{12}$ $\left(\dfrac{12}{12}\right)$

$= \frac{1}{6}$ $= \frac{1}{4}$ $= \frac{1}{3}$

$= 0.5$
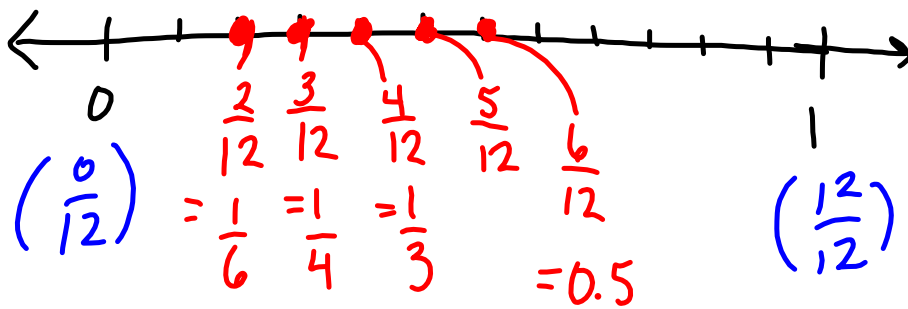
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17. a) $\dfrac{3}{4} > \dfrac{3}{5}$

0.75 > 0.6

$\dfrac{3}{4} > \dfrac{3}{5}$ LCM = 20

$\dfrac{15}{20} > \dfrac{12}{20}$

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21.a) $\dfrac{-5}{7} < \dfrac{-4}{7}$ c) $-2.2 \; \boxed{=} \; -\dfrac{11}{5}$

$-2.2 \; \bigcirc \; -2\dfrac{1}{5}$

$-2\dfrac{2}{10} \; \boxed{=} \; -2\dfrac{2}{10}$

$-2.2 \; \boxed{=} \; -2.2$

SECTION 3.2: ADDING RATIONAL NUMBERS

Remember -Rational numbers have many forms...

Natural Numbers: $1, 2, 3 \dots$

Whole Numbers: $0, 1, 2, 3 \dots$

Integers: $\dots -3, -2, -1, 0, 1, 2, 3 \dots$

Fractions (+ / -), Mixed Numbers: $\frac{1}{2}, -3\frac{1}{3}$

Decimals (term./rep.): $6.25, -6.\overline{6}$

Square Roots (perf. squrs.): $\sqrt{25}$

$$= 5$$

$$= \frac{5}{1}$$

THE SIGN RULES FOR ADDING, SUBTRACTING, MULTIPLYING, AND DIVIDING RATIONAL NUMBERS:

$$+ \; + \; = \; +$$

$$- \; - \; = \; +$$

$$+ \; - \; = \; -$$

$$- \; + \; = \; -$$

If you use a calculator, make sure you know how to input negative numbers!
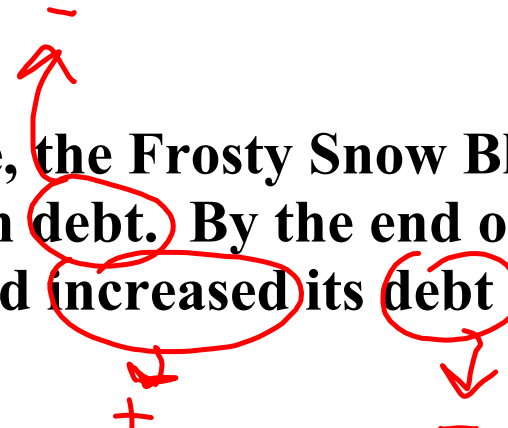
Example:

+

At 6 a.m., the temperature was -3 °C. By 10 a.m., the temperature had risen by 6 °C. What was the temperature at 10 a.m.?

$$-3 + 6$$
$$= \ 3 \ °C$$

Example:

At the beginning of June, the Frosty Snow Blower Company was $235.46 in debt. By the end of August, the company had increased its debt by $156.71.

a) Use a rational number to represent each amount.   -235.46 and -156.71

b) Calculate how much debt the company had at the end of August.

$$-235.46 + (-156.71)$$
$$= \ -235.46 - 156.71$$
$$= \ -392.17$$

At the end of August, the company owed $392.17.

Estimating if answers are positive or negative:

a)   -6.5 + 2.3

   =   -4.2

b)   9.75 + (-5.14)

   =   9.75 - 5.14

   =   4.61

c)   -0.235 + (-52.3)

   =   -0.235 - 52.3

   =   -52.535

ADDING RATIONAL NUMBERS IN FRACTION FORM:

To add fractions, they must have a COMMON, POSITIVE denominator. Then, ONLY the NUMERATORS are added working from left to right. Reduce answers where necessary.

ADDING FRACTIONS -

Examples:

$$\frac{1}{4} + \frac{3}{4}$$

$$= \frac{4}{4}$$

$$= 1$$

$$\frac{1}{4} + \frac{2}{3} \qquad LCM = 12$$

$$= \frac{3}{12} + \frac{8}{12}$$

$$= \frac{11}{12}$$

ADDING FRACTIONS -

Example:

$$4\frac{1}{4} \quad + \quad 1\frac{3}{8}$$

$$= 4\frac{2}{8} + 1\frac{3}{8}$$

$$= 5\frac{5}{8}$$

ADDING FRACTIONS -

Example:

$$-3\frac{1}{3} \quad + \quad 2\frac{5}{6}$$

$$= \frac{-10}{3} + \frac{17}{6} \qquad LCM = 6$$

$$= \frac{-20}{6} + \frac{17}{6}$$

$$= \frac{-3}{6} \qquad GCF = 3$$

$$= \frac{-1}{2}$$

CONCEPT REINFORCEMENT:

MMS9:

Page 111:   #5 and #7
Page 112:   #9 (no estimates), #10 and #11

(All answers in the form of improper fractions are expressed as mixed numbers in the back of the book.)