

SEPTEMBER 9, 2019

UNIT 1: RATIONAL NUMBERS

**SECTION 3.2:
ADDING 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.



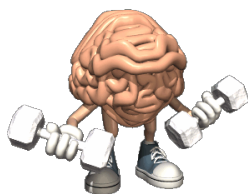
WARM UP: $-\frac{3}{5}$ $-\frac{11}{3}$ -2.4
 -0.6 $-3.\bar{6}$

- a) Place the following rational numbers on a number line: $-\frac{3}{5}$; $-\frac{11}{3}$; -2.4



- b) List the rational numbers from (a) in **DESCENDING** order.

$-\frac{3}{5}$, -2.4 , $-\frac{11}{3}$



WARM UP

1) Identify whether the number is rational or irrational

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

Handwritten notes: $\frac{2}{3}$ is written as $0.\overline{6}$ in red. $1.\overline{66}$ is written as $1.\overline{6}$ in red. $1.234567\dots$ is written as \overline{Q} in red. -2.25 is written as Q in red. A blue circle is drawn around the word "irrational" in the question.

2) Express each fraction as a decimal.

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

Handwritten notes: A blue vertical line is drawn to the right of the equations.

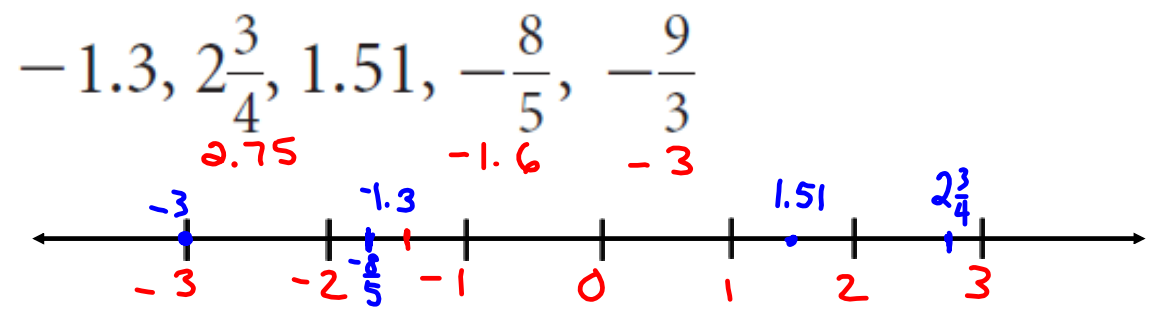
3) Express each decimal as a fraction or mixed number.

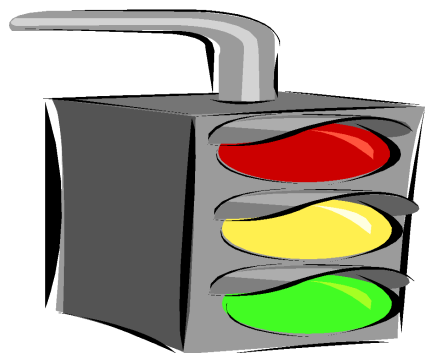
a) $0.1 = \frac{1}{10}$ b) $4.75 = 4\frac{75}{100} \div 5 = 4\frac{15}{20} \div 5 = 4\frac{3}{4}$ c) $-3.222 = -3\frac{222}{1000} = -3\frac{111}{500}$

Handwritten notes: Red vertical lines separate the three parts. Blue vertical lines are drawn to the right of the work.

WARM UP! :-)

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





Homework:

Questions?

Pages 102-103,
#16, 17, 22bcd & 25

Page 111 #5

SECTION 3.2: ADDING RATIONAL NUMBERS

Remember - Rational numbers have many forms...

Natural Numbers:

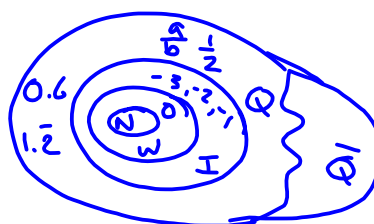
Whole Numbers:

Integers:

Fractions (+ / -), Mixed Numbers:

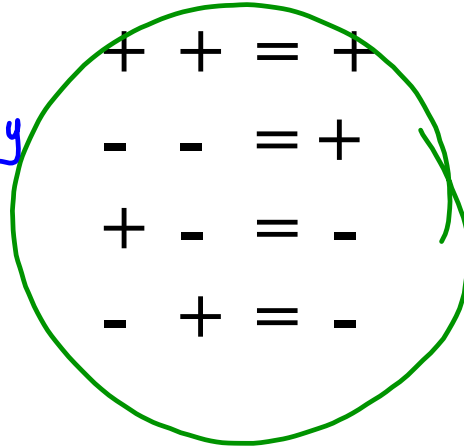
Decimals (term./rep.):

Square Roots (perf. squrs.):



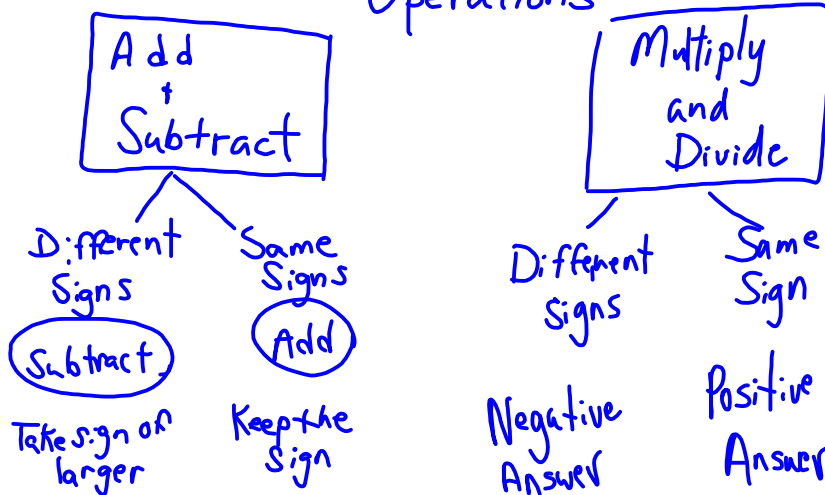
THE SIGN RULES FOR ADDING, SUBTRACTING, MULTIPLYING, AND DIVIDING RATIONAL NUMBERS:

Multiply + Divide



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

Integer Operations



Examples

$$-2 + 8 = 6$$

$$-4 - 7 = -11$$

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.?

$$-3 + 6 = 3^{\circ}\text{C}$$

$$6 - 2 = 4$$

$$-2 + 6 = 4$$

$$-5 - 4 = -9$$

$$-7 + 2 = -5$$

$$-3 - 4 = -7$$

$$-5 + 8 = 3$$

$$-20 - 2 = -22$$

$$7 - 9 = -2$$

$$\frac{5}{5}$$

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 -156.71

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

$$(-235.46) + (-156.71)$$

$$= -\$392.17$$

Estimating if answers are positive or negative:

a) $-6.5 + 2.3$

-4.2

$$\begin{array}{r} 6.5 \\ -2.3 \\ \hline 4.2 \end{array}$$

b) $9.75 + (-5.14)$

4.61

$$\begin{array}{r} 9.75 \\ -5.14 \\ \hline 4.61 \end{array}$$

c) $-0.235 + (-52.3)$

-52.535

$$\begin{array}{r} 52.3 \\ .235 \\ \hline 52.535 \end{array}$$

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:

$$\checkmark \frac{1}{\textcircled{4}} + \frac{3}{\textcircled{4}} = \frac{4}{4} = 1$$

$$\frac{1^{x^3}}{4} + \frac{2^{x^4}}{3^4} = \frac{3}{12} + \frac{8}{12} = \frac{11}{12}$$

(Handwritten notes: An arrow points from the 4 in the first denominator to 12, with a dotted line connecting to the 3^4 in the second denominator. Another arrow points from the 3^4 to 12.)

ADDING FRACTIONS -

Example:

$$\begin{aligned}
 & 4\frac{1}{4} + 1\frac{3}{8} \\
 & \begin{array}{l} \text{4x4+1} \\ \text{17} \end{array} \quad \begin{array}{l} \nearrow \\ \text{4} \end{array} \quad \begin{array}{l} \text{x} \\ \nearrow \\ \text{8} \end{array} \\
 & = \frac{17}{4} + \frac{11}{8} \\
 & = \frac{34}{8} + \frac{11}{8} \\
 & = \frac{45}{8} \\
 & \begin{array}{l} \text{5x8=40} \\ \text{5} \end{array} \quad \begin{array}{l} \text{4} \\ \text{5} \end{array} \quad \begin{array}{l} \text{4} \\ \text{5} \end{array} \\
 & = 5\frac{5}{8}
 \end{aligned}$$

ADDING FRACTIONS -

Example:

$$\begin{aligned}
 & -3\frac{1}{3} + 2\frac{5}{6} \\
 & = -\frac{10}{3} + \frac{17}{6} \\
 & = -\frac{20}{6} + \frac{17}{6} \\
 & = -\frac{3}{6} \\
 & = -\frac{1}{2}
 \end{aligned}$$

CONCEPT REINFORCEMENT:

MMS9:

Page 111: #5 and 7

Page 112: #9 (no estimates), 10, 11, 12, 13, 14,
and 15ab (not c)

Page 113: #16, 17, 18, 20, and 21

**(All answers in the form of improper fractions
are expressed as mixed numbers in the back of
the book except for #14.)**