UNIT 1: SIMPLIFY EXPRESSIONS

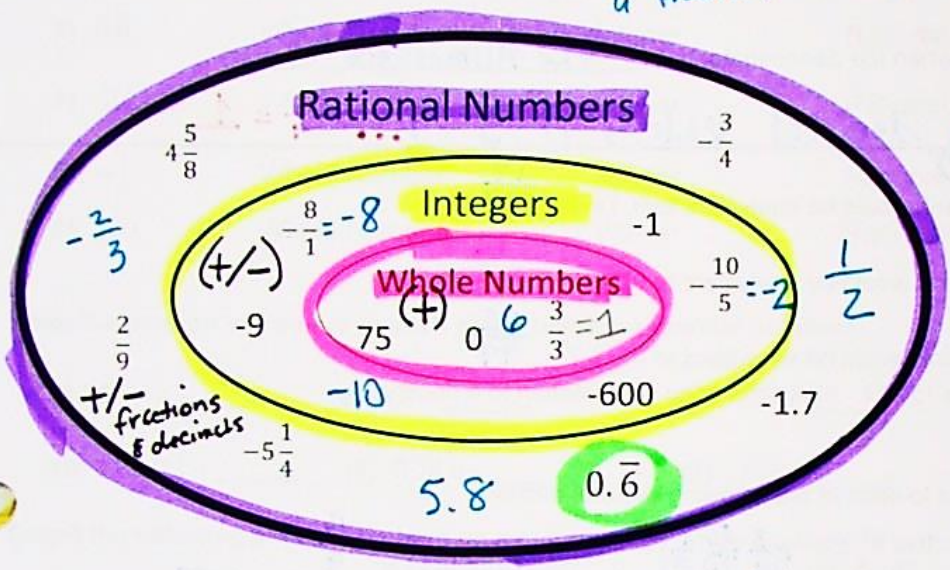
Notes

Objectives: I can identify types of rational numbers and express equivalent numbers for comparison.

Rational Numbers

Numbers have different classifications. Some numbers can be classified in multiple ways. A rational number is any number that you can write as a ratio, $\frac{a}{b}$ of two integers, where b is not zero. The diagram below shows relationships among rational numbers.

↖ can write as a fraction



Divide by zero?

$\frac{N}{0}$ ← No!

Divide by something else?

$\frac{0}{K}$ ← OK

$\frac{6}{3}$ $3\overline{)6}$ $\quad 2$

$\frac{6}{0}$ $0\overline{)6}$ error!

Always simplify numbers before classifying them. Every whole number is also an integer and a rational number. Every integer is also a rational number.

Practice

Identify the classification(s) for the following numbers by circling the classification(s) for each.

1)	5.8 $5\frac{8}{10}\to 5\frac{4}{5}\to\frac{29}{5}$	Whole Number	Integer	Rational Number
2)	6	Whole Number	Integer	Rational Number
3)	-10	Whole Number	Integer	Rational Number
4)	$0.\overline{6}$ $\frac{6}{9}=\frac{2}{3}$	Whole Number	Integer	Rational Number
5)	$\frac{1}{2}$	Whole Number	Integer	Rational Number
6)	$-\frac{2}{3}$	Whole Number	Integer	Rational Number

a negative on a fraction doesn't make it an integer ... only if you can simplify it to get an integer (Ex $-\frac{15}{3}=-5$)

Express each of the fractions as decimals.

1) $\frac{1}{9}$ = $0.\overline{1}$ 2) $\frac{2}{9}$ = $0.\overline{2}$ 3) $\frac{3}{9}$ = $0.\overline{3}$

4) $\frac{4}{9}$ = $0.\overline{4}$ 5) $\frac{5}{9}$ = $0.\overline{5}$ 6) $\frac{6}{9}$ = $0.\overline{6}$

7) $\frac{7}{9}$ = $0.\overline{7}$ 8) $\frac{8}{9}$ = $0.\overline{8}$ 9) $\frac{9}{9}$ = 1

10) What pattern is shown when the denominator is 9? the numerator is the repeating decimal unless it's 9... $\frac{9}{9}$ = 1

11) What fraction do you think would be equivalent to $0.\overline{14}$? $\frac{14}{99}$

12) What fraction do you think would be equivalent to $0.\overline{128}$? $\frac{128}{999}$

13) What fraction do you think would be equivalent to $0.\overline{32}$? $\frac{32}{99}$

Check your answers to #11 - 13 by changing your fraction to a decimal.

Write the fraction equivalent to each of the following decimal numbers.

14) $-0.\overline{2}$ = $-\frac{2}{9}$ 15) $5.\overline{3}$ = $5\frac{3}{9} = \boxed{5\frac{1}{3}}$ (reduce!) 16) $0.4444444\overline{4}$ = $\frac{4}{9}$

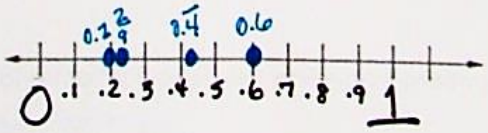
17) $-0.\overline{16}$ = $-\frac{16}{99}$ 18) $4.\overline{124}$ = $4\frac{124}{999}$ 19) $0.27272727\overline{27}$ = $\frac{27 \div 9}{99 \div 9} = \boxed{\frac{3}{11}}$ (÷9)

Graph the following sets of numbers on a number line. Then list them in order from least to greatest.

Between 0 and 1

20) {0.6, 0.2, $\frac{2}{9}$, $0.\overline{4}$}

$0.\overline{2}$

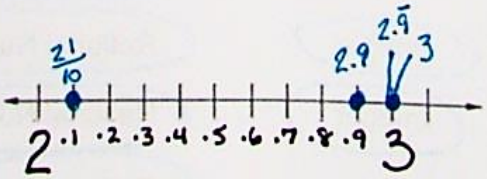


0.2 $\frac{2}{9}$ $0.\overline{4}$ 0.6

Between 2 and 3

21) {2.9, $\frac{21}{10}$, $2.\overline{9}$, 3}

2.1



$\frac{21}{10}$ 2.9 $2.\overline{9}$ 3

$2.\overline{9} = 2\frac{9}{9} = \boxed{3}$