2.1: Use Integers and Rational Numbers

Goals: *Compare and order rational numbers
*Classify numbers as whole, integer and rational
*Understand and apply absolute value and opposites

Whole Numbers: 0, 1, 2, 3… (No negatives, fractions, or decimals)

Integers: …–3, –2, –1, 0, 1, 2, 3…. (Positive and negative whole numbers- no fractions and decimals)

Rational Numbers: Any number that can be expressed as a fraction

Classify the following numbers using all names that apply:

a) 5	b) 0.6	c) –7	d) $-2\frac{2}{3}$	e) –24
Whole Integer Rational	Rational	Integer Rational	Rational	Integer Rational

*On a number line, where are larger numbers located? To the right

Where are smaller numbers located? To the left

So the biggest number is always… Furthest Right

Compare using: >, <, ≥, ≤, or = (fill in the missing space)

Ex: –17 _<___ 14

Ex: –22 __<__ –15

Ex: 5.2 __<___ 5.2003

Ex: 0.31 __>__ 0.301

Some Helpful Hints to Comparing Numbers:

1. Positive Numbers are always bigger

2. When comparing two negative numbers: The one with the smaller absolute value is actually bigger (Closer to zero on the number line)

3. When comparing decimals, positive or negative: Use the same number of decimal places (You can add zeros as placeholders if necessary)

4. To compare fractions: Need a common denominator, then compare numerators

5. To compare fractions to decimals and vice versa: Either make both decimals or both fractions

Change the following decimals to fractions:

a) 0.77

$\frac{77}{100}$

b) 0.64

$\frac{64}{100}$

$\frac{16}{25}$

c) 0.375

$\frac{375}{1000}$

$\frac{3}{8}$

Simplify the following fractions: (do NOT use long division)

a) $\frac{0.5}{10}$

$\frac{5}{100}$

$\frac{1}{20}$

b) $\frac{26}{1.3}$

$\frac{260}{13}$

20

c) $\frac{8}{1/2}$

$8 \div \frac{1}{2}$

$8 \cdot 2$

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Order the following numbers from least to greatest, then classify each number using all names that apply:

Ex: –0.03, 0.21, 0.09, –0.22

–0.22, –0.03, 0.09, 0.21

Ex: 3, –1.2, –2, 0

–2, –1.2, 0, 3

Ex: 4.5, $-\frac{3}{4}$, –2.1, 0.5

$-2.1, -\frac{3}{4}, 0.5, 4.5$

Ex: $\frac{1}{6}$, 1.75, $-\frac{2}{3}$, 0

$-\frac{2}{3}, 0, \frac{1}{6}, 1.75$

Ex: 3.6, –1.5, –0.31, –2.8

–2.8, –1.5, –0.31, 3.6

Ex: The apparent magnitude of a star is its brightness as observed from Earth. The greater the magnitude, the dimmer the star. Order the stars from brightest to dimmest.

Star	Arcturus	Sirius	Vega
Magnitude	–0.6	–1.47	0.03

Sirius, Arcturus, Vega

Opposites: Two numbers the same distance from 0, but on opposite sides

Absolute Value: The distance a number is from 0 on a number line

For the following numbers, find the opposite of each number and the absolute value of each number.

	$-a$	$\lvert a \rvert$
Ex: $a = -2.5$	2.5	2.5
Ex: $x = \frac{3}{4}$	$-\frac{3}{4}$	$\frac{3}{4}$
Ex: $y = \frac{3}{8}$	$-\frac{3}{8}$	$\frac{3}{8}$
Ex: $b = -0.6$	0.6	0.6