

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 than negative numbers
2. When comparing two negative numbers, the number with the smaller absolute value is actually bigger.
3. When comparing decimals, positive or negative, you usually need the same number of decimal places
4. To compare fractions, the denominators need to be the same.
5. To compare fractions to decimals, they either need to both be fractions or both be decimals

Change the following decimals to fractions:

a) 0.77

$$\frac{77}{100}$$

b) 0.64

$$\frac{64}{100}$$

c) 0.375

$$\frac{375}{1000}$$

$$\frac{16}{25}$$

$$\frac{3}{8}$$

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

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

$$8 \cdot 2$$
$$16$$

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. Ex: 3 and -3

Absolute Value: The distance a number is from 0 on a number line. It is always positive since it is distance. The bars act like parenthesis. Do what is inside first.

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

$$-a$$

$$|a|$$

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: $b = -0.6$

$$0.6$$

$$0.6$$

Ex: $|-2 - 3|$

$$\begin{array}{l} |-2 + -3| \\ |-5| \\ 5 \end{array}$$

Ex: $|-6 - (-2)|$

$$\begin{array}{l} |-6 + +2| \\ |-4| \\ 4 \end{array}$$

Ex: $|-5 - 9|$

$$\begin{array}{l} |-5 + -9| \\ |-14| \\ 14 \end{array}$$