

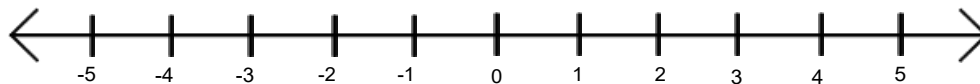
CHAPTER 3

Rational Numbers

Section 3.1: What is a Rational Number?

Integers, I: is a set of numbers that include positive and negative numbers and zero.

Imagine a number line:



These numbers are all integers. The set of integers does not include decimals or fractions.

Rational Numbers, Q: is any number that can be written in the form $\frac{m}{n}$ where m and n are both integers but $n \neq 0$.

Example 1: Using any two integers create a fraction and change to a decimal.

a) $\frac{-6}{3}$

b) $\frac{2}{3}$

c) $\frac{7}{8}$

d) $\frac{100}{25}$

Therefore, rational numbers include all integers, fractions, terminating decimals and repeating decimals.

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Example 2: Identify the rational numbers below:

a) $\frac{-1}{4}$

b) $\sqrt{9}$

c) $\frac{-4}{-9}$

d) $\sqrt{75}$

e) π

Example 3: Compare the following:

a) $\frac{-6}{3}$

b) $\frac{6}{-3}$

c) $-\frac{6}{3}$



Irrational Numbers, \bar{Q} : numbers that, when written as a decimal, are both non-repeating and non-terminating

Compare and Order Rational Numbers

Example 4: Use $>$, $<$, or $=$ compare these rational numbers. Show workings!

a) $\frac{4}{7}$ $\frac{5}{9}$

b) $\frac{-3}{8}$ $\frac{-5}{8}$

Use common denominators
then compare numerators!

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c) $\frac{2}{7}$ $\frac{2}{9}$

d) $\frac{-2}{7}$ $\frac{-2}{9}$

e) $\frac{-3}{4}$ $\frac{3}{4}$

f) $\frac{-10}{4}$ -2.8

g) $\frac{-7}{8}$ $\frac{7}{-8}$

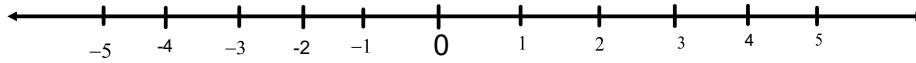
Remember:
If the question contains only fractions - work in fractions.
If the question contains only decimals - work in decimals.
If the question contains both fractions AND decimals - your choice!

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Example 5: Place these rational numbers in descending order. The number line may help you.

$$\frac{-3}{4}, 0.5, -1.8, -5, \frac{7}{3}, 2, -3.\bar{3}, 1\frac{3}{4}$$

Since the question contains both fractions and decimals you can use either fractions or decimals to compare!



Descending Order (from largest to smallest):

Writing a Rational Number between two given numbers.

Example 6: Identify a decimal between each pair of rational numbers.

a) $\frac{-1}{2}$ and $\frac{-1}{4}$ \longrightarrow

b) -0.25 and -0.26 \longrightarrow

Example 7: Identify a fraction between each pair of rational numbers.

a) $\frac{-2}{3}$ and $\frac{-3}{4}$ \longrightarrow

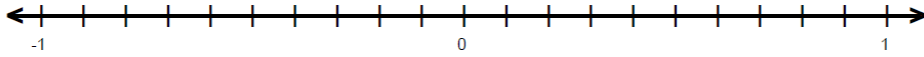
b) $\frac{5}{2}$ and $\frac{7}{3}$ \longrightarrow

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Placing Numbers on Number Line:

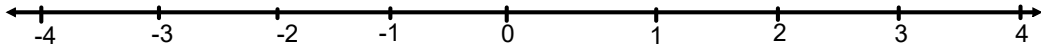
Example 8: Place these fractions in order. The number line may help you.

$$\frac{1}{2}, \frac{-3}{5}, \frac{1}{10}, \frac{2}{5}, \frac{-7}{10}$$



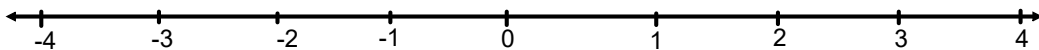
Example 9: Place the decimals in order. The number line may help you.

$$3.2, -1.3, 0.1, -2.7, 2.1$$



Example 10: Place the rational numbers in order. The number line may help you.

$$\frac{2}{7}, -1.3, 2\frac{5}{6}, -2\frac{3}{4}, 1.8$$



ASSIGN: p. 101, #6, 7, 8ac, 10ac, 12acegh, 14aceg, 21, 23 ac, 24 ac, 25