

Name: _____

Date: _____

THE RATIONAL NUMBERS N-GEN MATH[®] 7



There are many types of numbers that you will learn about in math. The easiest types of numbers to understand are the **whole numbers** and the **integers**. The sets of both are shown below.

THE WHOLE NUMBERS AND INTEGERS

Whole Numbers: $\{0, 1, 2, 3, 4, 5, \dots\}$

Integers: $\{\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \dots\}$

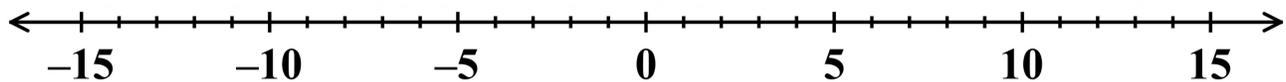
Exercise #1: One of the following two statements is true. Circle it based on the sets shown above.

I. Every whole number is also an integer.

II. Every integer is also a whole number.

Exercise #2: We should feel comfortable plotting integers on the number line. Do so with each of the following and label using its letter.

$$A = 7 \quad B = -4 \quad C = 0 \quad D = 12 \quad E = -10$$



Exercise #3: What is the distance (only a positive number) between:

(a) points A and D?

(b) points B and E?

(c) points D and E?

Of course, there are many types of numbers that are **not integers**. Every point (or location) on the number line above represents some **real number**.

Exercise #4: Give four numbers that are not integers.



Numbers that include fractions or decimals that terminate or repeat are known as **rational numbers** because they are, by definition, the **ratio of two integers**.

THE RATIONAL NUMBERS

Any number that can be expressed as the **ratio** of two **integers** is known as a **rational number**.

All rational numbers can be written as $\frac{p}{q}$ or $-\frac{p}{q}$ where p and q are whole numbers.

Exercise #5: For each of the following numbers, write in their rational form, i.e. as the ratio of two whole numbers.

(a) $2\frac{3}{5}$

(b) 0.7

(c) 3.87

(d) 5

So, we see that each **whole number** is also an **integer**. And each **integer** is also a **rational number**. Rational numbers can be plotted just as integers can, although their exact location may be harder to place.

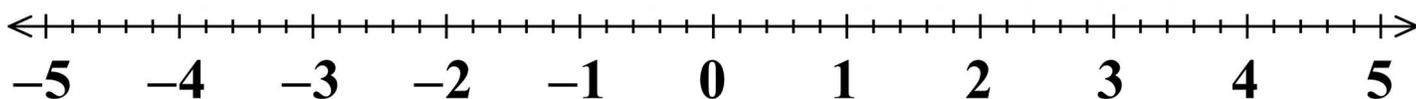
Exercise #6: Plot each of the following rational numbers on the number line below.

A = -3.4

B = 2.5

C = $\frac{10}{3}$

D = $-\frac{21}{5}$



Recall that we can compare rational numbers using greater than, $>$, less than, $<$, or equal, $=$, comparisons. Remember that one number is greater than another if it lies to the right of it on the number line.

Exercise #7: For each of the following, place a $>$, $<$, or $=$ symbol in each square to make the statement true.

(a) $4.99 \square 5.01$

(b) $4.37 \square -10.75$

(c) $\frac{24}{3} \square \frac{16}{2}$

(d) $-1.8 \square -5.65$



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THE RATIONAL NUMBERS
N-GEN MATH[®] 7 HOMEWORK

FLUENCY

1. Circle all numbers below that are whole numbers.

- | | | | |
|--------------------|--------|-------------------|-------------------|
| (a) 15 | (b) -4 | (c) $\frac{4}{3}$ | (d) $\frac{8}{2}$ |
| (e) $-\frac{1}{2}$ | (f) 7 | (g) 1.75 | (h) 0 |

2. Circle all the numbers below that are integers.

- | | | | |
|--------------------|------------------|---------|----------|
| (a) $\frac{5}{2}$ | (b) -4 | (c) 17 | (d) -2.5 |
| (e) $\frac{30}{6}$ | (f) $12.\bar{6}$ | (g) -25 | (h) -1 |

3. If you were asked to circle numbers in 1 and 2 that are **rational numbers** which of the following would you circle:

I. All of them

II. None of them

III. Some of them, but not all. _____

4. Which of the following is not equal to the rational number $\frac{7}{4}$? _____

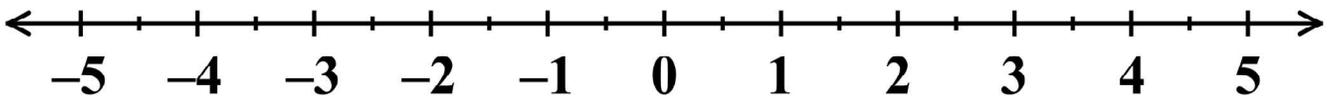
(1) $\frac{14}{8}$ (3) 1.75

(2) $\frac{10}{7}$ (4) $1\frac{3}{4}$ _____



5. Plot each of the following rational numbers on the number line below. Convert any improper fraction into either a mixed number or decimal and mark its location as closely as you can.

$$A = 4.5 \quad B = -2 \quad C = \frac{2}{3} \quad D = -4.8 \quad E = \frac{14}{5} \quad F = -\frac{7}{2} \quad G = \frac{4}{3}$$



6. For each of the following pairs of rational numbers, place a greater than symbol, $>$, a less than symbol, $<$, or an equality symbol, $=$, in the square to make the statement true.

(a) $24 \square 14$

(b) $1.3 \square -14.6$

(c) $-5 \square 0$

(d) $\frac{7}{3} \square \frac{13}{5}$

(e) $-\frac{15}{3} \square -5$

(f) $-8 \square -2$

(g) $\frac{8}{3} \square \frac{40}{15}$

(h) $0 \square -\frac{1}{2}$

(i) $-11.5 \square -\frac{31}{4}$

7. Which of the following numbers in **not** greater than -7.4 .

(1) -8.1

(3) 3

(2) -2

(4) 0

