7.4

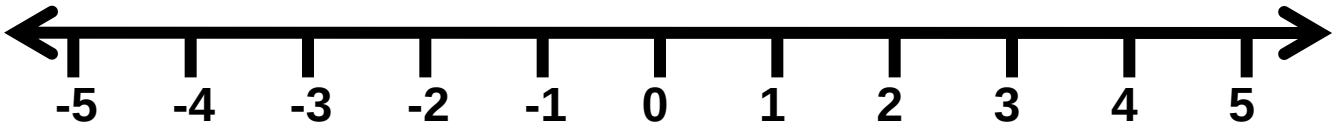
APPROXIMATING SQUARE ROOTS

Kinds of Numbers

Natural Numbers

Whole Numbers

Integers



Rational Number

Rational Numbers

- **You CAN change the number into a fraction**
- **It is a terminating decimal**
- **It is a nonterminating AND repeating decimal**
- **You CAN find the PERFECT square root of it**

Rational

Irrational

Organize the following numbers in as many groups as possible:

$\frac{5}{12}$	-12	-4.67	6	$-\frac{17}{31}$	4.581	23	π	-3	$\sqrt{25}$	0.37	$\frac{1}{2}$	$\sqrt{10}$	$0.\overline{31}$	2
0.101001000...			0.75	-13	$\frac{9}{5}$	$-\sqrt{123}$	3.01	73	$5.\overline{7}$	4.625	-62	$3\frac{5}{7}$	0	$\sqrt{81}$

Natural Numbers

Whole Numbers

Integers

Rational Numbers

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Irrational Numbers

Example 1

Identify all sets to which each of the following numbers belong:

$a)\ \frac{1}{9}$

$b)\ 0$

$c)\ -18$

Example 2

Terminating Decimal - When the division stops.

Repeating Decimal - When the last digit of the division repeats over and over, we use repeating decimal bars...

Both terminating and repeating decimals are RATIONAL

Write the decimal as a fraction. Simplify the fraction if possible.

a) 0.02 b) 0.105 c) -2.048

Example 3

If a decimal does not terminate and it doesn't repeat, it is IRRATIONAL.

Which is NOT a rational number?

$a)\ -\sqrt{32.8}$

$b)\ -0.48$

$c)\ 1\frac{1}{4}$

$d)\ -\frac{2}{3}$

Example 5

Order these numbers from least to greatest:

$$-\frac{1}{2},\ \frac{3}{4},\ -0.05,\ 0.83$$

On Your Own

Classify the real number.

1. $0.121221222\ldots$ **2.** $-\sqrt{196}$ **3.** $\sqrt[3]{2}$

Approximating Square Roots

Example 1

Estimate $\sqrt{71}$ to the nearest (a) integer and (b) tenth.

Approximating Square Roots

Example 2

Estimate $\sqrt{23}$ to the nearest (a) integer and (b) tenth.

Approximating Square Roots

Example 3

Estimate the square root to the nearest (a) integer and (b) tenth.

4. $\sqrt{8}$ **5.** $-\sqrt{13}$ **6.** $-\sqrt{24}$ **7.** $\sqrt{110}$

Approximating Square Roots

Example 4

Which is greater, $\sqrt{5}$ or $2\frac{2}{3}$?

Approximating Square Roots

Example 5

Which is greater, $\sqrt{0.49}$ or 0.71?