

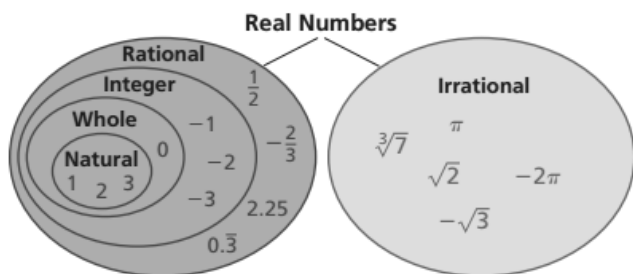
Name: \_\_\_\_\_

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## Properties of Real Numbers Rational vs. Irrational

### Real Numbers

Rational numbers and irrational numbers together form the set of **real numbers**.



A rational number is a number that can be written as the ratio of two integers. An **irrational number** cannot be written as the ratio of two integers.

- The square root of any whole number that is not a perfect square is irrational. The cube root of any integer that is not a perfect cube is irrational.
- The decimal form of an irrational number neither terminates nor repeats.

### Classification

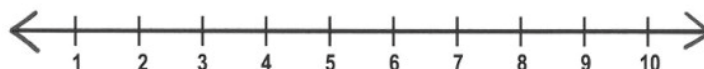
Number	Classification
$\sqrt{12}$	_____
$-0.\overline{25}$	_____
$-\sqrt{9}$	_____
$\frac{72}{4}$	_____
$\pi$	_____

### Exercise #1:

**Classify the real number.**

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

**Exercise #2:** Estimate the square root of 71 without a calculator and place it on the number line below.



**Exercise #3:** Estimate each square root without a calculator and place each of them on the given number line.

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



**Exercise #4:** Try and reason out the next question without a calculator.

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

**Exercise #5:** Use your calculator!

**Tell whether the rational number is a reasonable approximation of the square root.**

5.  $\frac{559}{250}, \sqrt{5}$

6.  $\frac{3021}{250}, \sqrt{11}$

7.  $\frac{678}{250}, \sqrt{28}$

8.  $\frac{1677}{250}, \sqrt{45}$

**Exercise #6:**

**Classify the real number.**

9. 0

10.  $\sqrt[3]{343}$

11.  $\frac{\pi}{6}$

12.  $-\sqrt{81}$

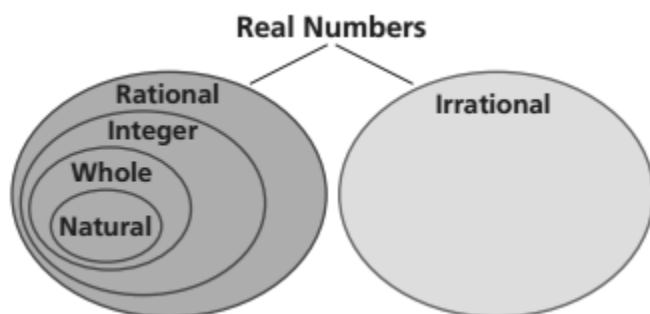
13. -1.125

14.  $\frac{52}{13}$

15.  $\sqrt[3]{-49}$

16.  $\sqrt{15}$

**Exercise #7:**



19. **VENN DIAGRAM** Place each number in the correct area of the Venn Diagram.

- a. the last digit of your phone number
- b. the square root of any prime number
- c. the ratio of the circumference of a circle to its diameter

**Exercise #8:**

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

20.  $\sqrt{46}$

21.  $\sqrt{685}$

22.  $-\sqrt{61}$

23.  $-\sqrt{105}$

24.  $\sqrt{\frac{27}{4}}$

25.  $-\sqrt{\frac{335}{2}}$

**Exercise #9:**

**Which number is greater? Explain.**

26.  $\sqrt{20}, 10$

27.  $\sqrt{15}, -3.5$

28.  $\sqrt{133}, 10\frac{3}{4}$

29.  $\frac{2}{3}, \sqrt{\frac{16}{81}}$

30.  $-\sqrt{0.25}, -0.25$

31.  $-\sqrt{182}, -\sqrt{192}$