## Sets of Numbers in the Real Number System

#### Reals

A real number is either a rational number or an irrational number.

$$4,-7,0,\frac{2}{3},\sqrt{11}$$

#### **Rationals**

A rational number is any number that can be put in the form  $\frac{p}{q}$  where p and q are integers and  $q \neq 0$ .

$$3, \frac{12}{6}, -\frac{5}{2}, 4\frac{1}{7}, \frac{8}{13}$$

#### **Irrationals**

An irrational number is a nonrepeating, nonterminating decimal.

$$\sqrt{2}$$
,  $\pi$ ,  $-\sqrt[3]{7}$ , 0.121231234...,  $\sqrt{13}$ 

### **Non-Integer Fractions**

A non-integer fraction is a fraction whose numerator is <u>not</u> a multiple of the denominator.

$$\frac{1}{2}$$
,  $-\frac{5}{4}$ ,  $8\frac{3}{7}$ 

## **Integers**

The integers consist of the natural numbers, 0, and the opposites of the natural numbers.

$$\dots -2, -1, 0, 1, 2, 3, \dots$$

...-5, -4, -3, -2, -1

#### Whole Numbers

The whole numbers consist of the natural numbers and 0.

0, 1, 2, 3, 4, . . .

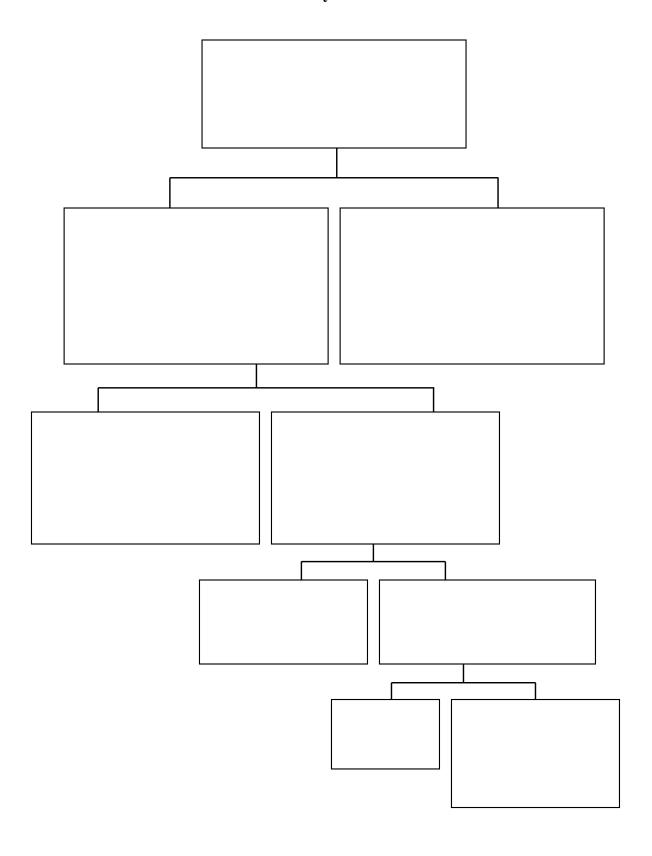
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#### **Natural Numbers**

The natural numbers are also referred to as the counting numbers.

 $1, 2, 3, 4, \dots$ 

# **Real Number System Worksheet**



## **The Number System**

Identify the sets to which each of the following numbers belongs by marking an "X" in the appropriate boxes.

|     | Number                | <u>N</u> atural<br>Numbers | <u>W</u> hole<br>Numbers | <u>I</u> ntegers | Rational Numbers | <u>Irrational</u><br><u>N</u> umbers | <u>R</u> eal<br>Numbers |
|-----|-----------------------|----------------------------|--------------------------|------------------|------------------|--------------------------------------|-------------------------|
| 1.  | $-\sqrt{17}$          |                            |                          |                  |                  |                                      |                         |
| 2.  | -2                    |                            |                          |                  |                  |                                      |                         |
| 3.  | $-\frac{9}{37}$       |                            |                          |                  |                  |                                      |                         |
| 4.  | 0                     |                            |                          |                  |                  |                                      |                         |
| 5.  | -6.06                 |                            |                          |                  |                  |                                      |                         |
| 6.  | $4.5\overline{6}$     |                            |                          |                  |                  |                                      |                         |
| 7.  | 3.050050005           |                            |                          |                  |                  |                                      |                         |
| 8.  | 18                    |                            |                          |                  |                  |                                      |                         |
| 9.  | $\frac{-43}{0}$       |                            |                          |                  |                  |                                      |                         |
| 10. | $\pi$                 |                            |                          |                  |                  |                                      |                         |
| 11. | .634                  |                            |                          |                  |                  |                                      |                         |
| 12. | $\sqrt{225}$          |                            |                          |                  |                  |                                      |                         |
| 13. | .634                  |                            |                          |                  |                  |                                      |                         |
| 14. | $\sqrt{\frac{4}{49}}$ |                            |                          |                  |                  |                                      |                         |
| 15. | $-\sqrt{64}$          |                            |                          |                  |                  |                                      |                         |

|     | Number             | <u>N</u> atural<br>Numbers | <u>W</u> hole<br>Numbers | <u>I</u> ntegers | Rational<br>Numbers | <u>I</u> rrational<br><u>N</u> umbers | <b>R</b> eal<br>Numbers |
|-----|--------------------|----------------------------|--------------------------|------------------|---------------------|---------------------------------------|-------------------------|
| 16. | $\sqrt{13}$        |                            |                          |                  |                     |                                       |                         |
| 17. | -5                 |                            |                          |                  |                     |                                       |                         |
| 18. | $\frac{2}{3}$      |                            |                          |                  |                     |                                       |                         |
| 19. | -0.083             |                            |                          |                  |                     |                                       |                         |
| 20. | 27                 |                            |                          |                  |                     |                                       |                         |
| 21. | $2.6\overline{47}$ |                            |                          |                  |                     |                                       |                         |
| 22. | 3.0505             |                            |                          |                  |                     |                                       |                         |
| 23. | -198               |                            |                          |                  |                     |                                       |                         |
| 24. | $-\frac{1}{2}$     |                            |                          |                  |                     |                                       |                         |
| 25. | 10                 |                            |                          |                  |                     |                                       |                         |

#### ANSWERS

 1.  $\underline{IN}$ ,  $\underline{R}$  3.  $\underline{RN}$ ,  $\underline{R}$  5.  $\underline{RN}$ ,  $\underline{R}$  7.  $\underline{IN}$ ,  $\underline{R}$  9. None
 11.  $\underline{RN}$ ,  $\underline{R}$  13.  $\underline{RN}$ ,  $\underline{R}$  15.  $\underline{I}$ ,  $\underline{RN}$ ,  $\underline{R}$  

 17.  $\underline{I}$ ,  $\underline{RN}$ ,  $\underline{R}$  19.  $\underline{RN}$ ,  $\underline{R}$  21.  $\underline{RN}$ ,  $\underline{R}$  23.  $\underline{I}$ ,  $\underline{RN}$ ,  $\underline{R}$  25.  $\underline{N}$ ,  $\underline{W}$ ,  $\underline{I}$ ,  $\underline{RN}$ ,  $\underline{R}$