Components of the Real Number System

| • | • | • | • | • | • | • | • | ••• 00 | (infinity) |
|---|--------------|----------------|------------|------------|--------------|-------------------|------------|---------|---------------------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| Natur | al or C | ounting | g Num | bers: | | | | | |
| To ren | nember | , think o | of coun | ting or | of how | things | exist in | nature. | These are just points. |
| | | | | | | | | | |
| | | | | | | | | | |
| • | • | • | • | • | • | • | • | • | •••• ∞ (infinity) |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| Whole | e Numb | pers: | | | | | | | |
| To ren | nember | , we've | added | a "hole | e" – zer | o! Thes | se are sti | ll just | points. |
| | | | | | | | | | |
| | | | | | | | | | |
| | • | • | • | • | • | • | • | • | •••• ∞ (infinity) |
| _ | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 |
| Intege | ers: | | | | | 2 | | | |
| Maybe | e these of | develop | ed with | h the cro | eation | of mone | y?? | To ren | nember, we've gone "inte" debt to get |
| negatr | ve num | bers! S | till just | t points; | ; no lin | e yet. | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| -∞ ←•• | • | ТТ | ТТ | ТТ | | | ТТ | | $ \longrightarrow \infty $ |
| | -2 -1 | 3/4 | -1 | -0.5 | O .25 | ³ /4 1 | 1.5 | 2 | |
| Ratio | nal Nur | nbers: | | | | | | | |
| To remember, we're now "rational" – which means sane – and connected the dots on the number line, | | | | | | | | | |
| each as an integer, a fraction, or a decimal (terminating or repeating only). | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | $\sqrt[3]{-2}$ | 5 | $\sqrt{2}$ | | | π | | |
| | | | I | Γ | ٦ | | | | |
| •••→∞- | • | | | | | | | | $\rightarrow \rightarrow \infty$ |
| | Â | 7 | ' 2 | ' 4 | ' ^ ' | · • · | ່ | 7 | Λ |

Although all of these numbers "<u>really</u>" exist, we can't mark some clearly on the number line because

we can't define them by a specific point, only as symbols of never-ending decimals.

Real Numbers:



Image from: http://www.softmath.com

Number Systems Worksheet

| -1 | Counting Numbers | Whole Numbers | Integers | Rational Numbers | Real Numbers |
|------------|---------------------|------------------|----------|---------------------|-----------------|
| 568 | Counting Numbers | Whole Numbers | Integers | Rational Numbers | Real Numbers |
| .35 | Counting Numbers | Whole Numbers | Integers | Rational Numbers | Real Numbers |
| 0 | Counting Numbers | Whole Numbers | Integers | Rational Numbers | Real Numbers |
| $\sqrt{2}$ | Counting Numbers | Whole Numbers | Integers | Rational Numbers | Real Numbers |

Circle all the number systems each value can belong to:

Match each description with the number system it belongs to:

| _ | Description | Number System |
|----|---|----------------------|
| a. | Can include values like π | Counting Numbers |
| b. | Can't include 0 | Whole Numbers |
| c. | Most basic system that includes negatives | Integers |
| d. | Most basic system that includes 0 | Rational Numbers |
| e. | Most basic system that includes fractions | Real Numebrs |

Circle **T** (True) or **F** (False) for each statement:

| Т | F | Zero can be part of the rational number system. |
|---|---|--|
| Т | F | Fractions can be part of the whole number system. |
| Т | F | The answer to $\sqrt{16}$ can be an integer. |
| Т | F | Negative numbers can be part of the real number system. |
| Т | F | The fraction $\frac{3}{8}$ can be part of the natural number system. |
| Т | F | The decimal 0.333333 can be part of the rational number system. |