Pre-Calculus 11

Answers

**REAL NUMBER SYSTEM**
**Classification of Numbers**

1. For every given number, clearly state all the sets the number belongs to. If the given number is not real, write: "Not $\mathbb{R}$", using the notation introduced in class.

| | Number | All sets a given number belongs to |
|---|---|---|
| 1 | $\sqrt{8}$ | $\mathbb{R}$, $\overline{\mathbb{Q}}$ |
| 2 | $\pi$ | $\mathbb{R}$, $\overline{\mathbb{Q}}$ |
| 3 | $0$ | $\mathbb{R}$, $\mathbb{Q}$, $\mathbb{Z}$ |
| 4 | $-4.5$ | $\mathbb{R}$, $\mathbb{Q}$ |
| 5 | $\frac{5}{1.2}$ | $\mathbb{R}$, $\mathbb{Q}$ |
| 6 | $5.1$ | $\mathbb{R}$, $\mathbb{Q}$ |
| 7 | $\sqrt{-12}$ | not $\mathbb{R}$ |
| 8 | $1.\overline{47}$ | $\mathbb{R}$, $\mathbb{Q}$ |
| 9 | $-0.9$ | $\mathbb{R}$, $\mathbb{Q}$ |
| 10 | $\frac{\sqrt{6}}{5}$ | $\mathbb{R}$, $\overline{\mathbb{Q}}$ |
| 11 | $1.85$ | $\mathbb{R}$, $\mathbb{Q}$ |
| 12 | $10^9$ | $\mathbb{R}$, $\mathbb{Q}$, $\mathbb{Z}$, $\mathbb{W}$, $\mathbb{N}$ |
| 13 | $10^{-5}$ | $\mathbb{R}$, $\mathbb{Q}$ |
| 14 | $x$ | not enough information as "$x$" can stand for any number |

| | Number | All sets a given number belongs to |
|---|---|---|
| 15 | $\mathbf{149}$ | $\mathbb{R}, \mathbb{Q}, \mathbb{Z}, \mathbb{W}, \mathbb{N}$ |
| 16 | $\mathbf{-0.03}$ | $\mathbb{R}, \mathbb{Q}$ |
| 17 | $\mathbf{\sqrt{16}} = 4$ | $\mathbb{R}, \mathbb{Q}, \mathbb{Z}, \mathbb{W}, \mathbb{N}$ |
| 18 | $\mathbf{-2}$ | $\mathbb{R}, \mathbb{Q}, \mathbb{Z}$ |
| 19 | $\mathbf{\frac{20}{5}} = 4$ | $\mathbb{R}, \mathbb{Q}, \mathbb{Z}, \mathbb{W}, \mathbb{N}$ |
| 20 | $\mathbf{-\sqrt{121}} = -11$ | $\mathbb{R}, \mathbb{Q}, \mathbb{Z}$ |

2. Give two examples of a number that is real but not rational: $\pi$ and $\sqrt{11}$.

3. Describe integers in words without giving examples.

Integers is a set of numbers that consists of all counting (= natural) numbers, their opposites and the number zero.

4. Define a rational number.

A rational number is a real number that can be expressed as a fraction $\frac{p}{q}$, where $p \in \mathbb{Z}$, $q \in \mathbb{Z}$, and $q \neq 0$.

Note: "$\in$" is a symbol for "is an element of" or "belongs to/in".