Real Numbers

INTRODUCTION OF NUMBER SYSTEM

EXERCISE

Ex.1 State whether the given statement is true or false :

(i) The sum of two rationals is always rational

(ii) The product of two rationals is always rational

(iii) The sum of two irrationals is an irrational.

(iv) The product of two irrationals is an irrational

(v) The sum of a rational and an irrational is irrational

(vi) The product of a rational and an irrational is irrational

Ex.2 Define (i) rational numbers

(ii) irrational numbers

(iii) real numbers.

Ex.3 Express each of the following as a fraction in simplest form :

(i) 0.8 (ii) $2.\overline{4}$ (iii) $0.\overline{24}$

(iv) $0.1\overline{2}$ (v) $2.2\overline{4}$ (vi) $0.\overline{365}$

Ex.4 Prove that $\sqrt{3}$ is an irrational number.

Ex.5 Prove that $\sqrt{5}$ is irrational number.

Ex.6 Prove that $5+\sqrt{2}$ is irrational.

Ex.7 Prove that $\sqrt{2}+\sqrt{3}$ is irrational.

Ex.8 Can we have any $n \in N$, where 7^n ends with the digit zero.

Ex.9 Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or non - terminating decimal expansion :

(i) $\frac{77}{210}$ (ii) $\frac{15}{1600}$

Ex.10 Write a rational number between $\sqrt{2}$ and $\sqrt{3}$.

Ex.11 Prove that :

(i) $\frac{\sqrt{5}}{3}$ (ii) $2\sqrt{7}$ are irrationals.

ANSWER

1. (i) True (ii) True (iii) False

(iv) False (v) True (vi) True

3. (i) $\frac{8}{9}$ (ii) $\frac{22}{9}$ (iii) $\frac{8}{33}$

(iv) $\frac{11}{90}$ (v) $\frac{101}{45}$ (vi) $\frac{181}{495}$

9. (i) Non-terminating (ii) Terminating

11. $\frac{3}{2}$