CBSE Grade 10 Mathematics

Real Numbers

Q1) Use the Euclid's division Lemma to show that the cube of any positive integer is of form 9m, 9m + 1 or 9m + 8.

Q2) Use Euclid's division Lemma to find HCF of 4052 and 12576.

Q3) Two Tankers contain 850 liters and 680 liters of kerosene oil respectively. Find the maximum capacity of a container which can measure the kerosene oil of both the tankers when used an exact number of times.

Q4) Find LCM and HCF of 825, 675 and 450 using prime factorization method.

Q5) Two Army cadets A and B are marching in a circular field. Cadet A takes 36 minutes to take one complete round while cadet B takes 27 minutes for the same. Suppose they both start at same point and moving in same direction. After how many minutes they will meet at starting point?

Q6) Explain why 7 x 17 x 11 + 17 is a composite number?

Q7) Prove $3 + 2\sqrt{5}$ is irrational number.

Q8) Consider the number $\frac{8^n}{50^m}$, where n, m is a natural number. State whether the number will have a terminating decimal expansion or a non-terminating repeating decimal expansion.

Answer Key

A1) [HINT: Let x be any positive integer then it is of form 3q, 3q + 1, 3q + 2. Now cube each of these and show they can re-written in the form of 9m, 9m + 1, 9m + 8.]

A2) 12576 = 4025 x 2 +420

4025 = 420 x 9 + 272

420 = 272 x 1 + 148

272 = 148 x 1 + 124

124 = 24 x 5 + 4

24 = 4 x 6 + 0 hence HCF = 4

A3) 170, [HCF of 850 and 680 = 170]

A5) 108 minutes. [LCM of 36 and 27 is 108]

A6) 7 x 17 x 11 + 17 = 17 7 x 11 + 1) = 17 x 78 which is a composite number.

A7) Let, 3+ $2\sqrt{5}$ is rational number.

That is, we can find co-prime integers a and b, b ≠0

Such that, 3+ $2\sqrt{5} = \frac{a}{b}$ where b ≠ 0

Therefore, $\frac{a}{b}$= 3+ $2\sqrt{5}$ $\implies$ $\frac{a}{b}$ - 3 = $2\sqrt{5}$

Since a and b are integers, we get $\frac{a}{b}$ - 3 as rational, and so $\sqrt{5}$ is rational. But this contradicts the fact that $\sqrt{5}$ is irrational. This contradiction has arisen because of our incorrect assumption that 3 +2 $\sqrt{5}$ is rational. So, we conclude that 3 + 2 $\sqrt{5}$ is irrational.

A8) Let $\frac{8^n}{50^m} = \frac{p}{q}$, $Now\ \frac{8^n}{50^m} = \frac{2^{3^n}}{2^m 5^{2m}}$ Since q is of form $2^m 5^n$, $\frac{8^n}{50^m}$ is a rational number with terminating decimal expansion