Real Numbers Ex 1.5 Q9

Answer :

Let us assume that $5 - 2\sqrt{3}$ is rational .Then, there exist positive co primes a and b such that

$$5-2\sqrt{3} = \frac{a}{b}$$

$$2\sqrt{3} = \frac{a}{b} - 5$$

$$\sqrt{3} = \frac{\frac{a}{b} - 5}{2}$$

$$\sqrt{3} = \frac{a - 5b}{2b}$$

This contradicts the fact that $\sqrt{3}$ is an irrational number

Hence $5-2\sqrt{3}$ is irrational

Real Numbers Ex 1.5 Q10

Answer :

Let us assume that $2 - 3\sqrt{5}$ is rational .Then, there exist positive co primes a and b such that

$$2-3\sqrt{5} = \frac{a}{b}$$

$$3\sqrt{5} = \frac{a}{b} - 2$$

$$3\sqrt{5} = \frac{\frac{a}{b} - 2}{3}$$

$$\sqrt{5} = \frac{a - 2b}{3b}$$

This contradicts the fact that $\sqrt{5}$ is an irrational number

Hence $2 - 3\sqrt{5}$ is irrational

Real Numbers Ex 1.5 Q11

Answer :

Let us assume that $4 - 5\sqrt{2}$ is rational .Then, there exist positive co primes a and b such that

$$4-5\sqrt{2} = \frac{a}{b}$$

$$5\sqrt{2} = \frac{a}{b} - 4$$

$$\sqrt{2} = \frac{\frac{a}{b} - 4}{5}$$

$$\sqrt{2} = \frac{a - 4b}{5b}$$

This contradicts the fact that $\sqrt{2}$ is an irrational

Hence $4-5\sqrt{2}$ is irrational

Real Numbers Ex 1.5 Q12

Answer :

Let us assume that $2\sqrt{3}-1$ is rational .Then, there exist positive co primes a and b such that

$$2\sqrt{3}-1=\frac{a}{b}$$

$$2\sqrt{3}=\frac{a}{b}+1$$

$$\sqrt{3}=\frac{\frac{a}{b}+1}{2}$$

$$\sqrt{3}=\frac{a+b}{2b}$$

This contradicts the fact that $\sqrt{3}$ is an irrational

Hence $2\sqrt{3}-1$ is irrational

********** END **********