Answer on Question #50453 – Math – Algebra

Which of the following correctly describes the product below?

A. irrational

B. neither rational nor irrational

C. a combination of both rational and irrational

D. rational

Solution

Consider two irrational numbers, for example, $\sqrt{2}$ and $\sqrt{3}$ then product of these numbers is $\sqrt{2}*\sqrt{3}=\sqrt{6}$, which is also irrational number(case A).

But products $\sqrt{2}*\sqrt{2}=2$, $\sqrt{2}*\sqrt{8}=\sqrt{16}=4$ are rational numbers(case D).

Hence, product of irrational numbers will be rational or irrational number.

Product of rational numbers always will be a rational number (case D).

The product of two numbers, one of which rational and irrational else always will be an irrational number (case C): for example, product of $\sqrt{2}$ and 2 is $2*\sqrt{2}=2\sqrt{2}$, that is, also irrational number.

Actually, any real number, not equal to zero, can be written as the product of two irrational numbers.

Let **α** will be rational, then take, for example,

$$\alpha=\sqrt{2}*\frac{\alpha}{\sqrt{2}}$$

where $\sqrt{2}$ and $\frac{\alpha}{\sqrt{2}}$ are irrational.

If **α** will be irrational, then take, for example,

$$\alpha=\sqrt{\alpha}*\sqrt{\alpha}$$

where $\sqrt{\alpha}$ is irrational.

Answer: A; C; D.