TOPIC
Mathematics – Section I – Question 3

QUESTION
The Newton-Raphson method formula for finding the square root of a real number R from the equation $x^2 = R$ is

(A) $x_{i+1} = \dfrac{x_i}{2}$

(B) $x_{i+1} = \dfrac{3x_i}{2}$

(C) $x_{i+1} = \dfrac{1}{2}\left(x_i + \dfrac{R}{x_i}\right)$

(D) $x_{i+1} = \dfrac{1}{2}\left(3x_i - \dfrac{R}{x_i}\right)$

HINT
Rewrite the equation in the form $f(x) = 0$, that is,
$$f(x) = x^2 - R = 0$$
Now apply the Newton's formula
$$x_{i+1} = x_i - \frac{f(x_i)}{f'(x_i)}$$

CONTRIBUTOR
Autar Kaw