

TOPIC

Mathematics

QUESTION

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

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

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

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

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

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

This question of the day was provided by the courtesy of Professor [Autar Kaw](#) of the [University of South Florida](#) from the book [Fundamentals of Engineering Examination Sample Questions General Engineering](#).