

PROBLEM

If $f(x) = kx^3 - 9x^2 + 9x + 3$ is monotonically increasing in R , then

a. $k < 3$

b. $k \leq 2$

c. $k \geq 3$

d. none of these

SOLUTION

∴ c. $f'(x) = 3kx^2 - 18x + 9 = 3[kx^2 - 6x + 3] \geq 0 \forall x \in R$

or $D = b^2 - 4ac \leq 0, k > 0$, i.e., $36 - 12k \leq 0$

or $k \geq 3$