

1. Find the number c that satisfy the conclusion of the mean value theorem for the function $f(x) = x^2 + 3x - 4$ on the interval $[0, 6]$
2. Find the number c that satisfy the conclusion of the mean value theorem for the function $f(x) = \frac{x}{x-1}$ on the interval $[2, 5]$
3. If $f(2) = 8$ and $f'(x) \leq 25$ on $[2, 10]$ what is the largest possible value for $f(10)$?
4. Find the intervals over which the function $f(x) = x^3 - 3x^2 - 9x + 4$ is increasing and decreasing.