

The Mean Value Theorem – Answers

For questions 1 & 2 determine all the number(s) c which satisfy the conclusion of the Mean Value Theorem for the given function and interval

1. $h(z) = 4z^3 - 8z^2 + 7z - 2$ on $[2, 5]$

$$c = \frac{2 + \sqrt{79}}{3} \approx 3.6294$$

2. $A(t) = 8t + e^{-3t}$ on $[-2, 3]$

$$c = -1.0973$$

3. Suppose we know that $f(x)$ is continuous and differentiable on the interval $[-7, 0]$, that $f(-7) = -3$ and that $f'(x) \leq 2$. What is the largest possible value for $f(0)$?

$$f(0) \leq 11$$

For the following exercises, use the Mean Value Theorem and find all points $0 < c < 2$ such that $f(2) - f(0) = f'(c)(2 - 0)$.

4. $f(x) = x^3$

$$c = \frac{2\sqrt{3}}{3}$$

5. $f(x) = (x - 1)^{10}$

$$c = 1$$