

Due date: _____**Name:** _____

1. Show that the function $f(x) = \sqrt{x} + \sqrt{x+1} - 6$ has exactly one zero on the interval $(0, \infty)$.

2. Show that the equation $2x + \cos x = 0$ has exactly one real solution.

3. Show that the equation $x^3 + 3x + 1 = 0$ has exactly one real solution.

4. Verify that $f(x) = \frac{1}{x}$ satisfies the hypotheses of the Mean Value Theorem on $[1, 3]$. Then find all numbers c that satisfy the conclusion of the Mean Value Theorem.

5. Verify that $f(x) = \ln(x - 1)$ satisfies the hypotheses of the Mean Value Theorem on $[2, 4]$. Then find all numbers c that satisfy the conclusion of the Mean Value Theorem.

6. Verify that $f(x) = \sin^{-1} x$ satisfies the hypotheses of the Mean Value Theorem on $[-1, 1]$. Then find all numbers c that satisfy the conclusion of the Mean Value Theorem.

7. Verify that $f(x) = x^{2/3}$ satisfies the hypotheses of the Mean Value Theorem on $[0, 1]$. Then find all numbers c that satisfy the conclusion of the Mean Value Theorem.

Q: What has a head and a tail, but no body?

Optional exercises from the Stewart textbook if you'd like more practice:
4.2 (p.291) #1-11 odd, 15-19 odd