CALCULUS I—Worksheet #19

1. Find c for Rolle's Theorem for $f(x) = x^3 - 9x$ on $[-3,3]$.

2. Find c for the Mean Value Theorem for $f(x) = \frac{x-2}{x}$ on $[2,4]$.

3. c for s Theorem $f(x) = 5^{2} - 15x$ on $0,3]$.

. Find c for the Mean Value or $f(x) = {}^{3} + 1$ $[-2$ $]$.

5. Why does $f(x) = \sqrt{x^2 - 4}$ not hold true for the Mean Value Theorem on $[-3,1]$

6. $f(x) = \frac{x^2 - 49}{x - 7}$ when $x \neq 7$ and $f(x) = 7$ when $x = 7$.

a) Is f continuous at $x = 7$? Show why or why not.

b) Is f continuous at $x = 0$? Show why or why not.

c) Is f continuous at $x = -7$? Show why or why not.

7. $f(x) = \frac{x^2 - 36}{x - 6}$ when $x \neq 6$ and $f(6) = k$. Find k so that f is continuous at $x = 6$.

8 – 10 Solve the following using variables separate:

8. If $\frac{dy}{dx} = x^2$ and $y = -4$ when $x = 0$, then find y.

9. $\frac{dy}{dx} = y^2\sqrt{x}$

10. $\frac{dy}{dx} = \frac{x-2}{y+2}$

11. $\int \sin^3 4x \, dx$

12. $\int \sin^2 4x \, dx$

13. $\int \frac{1}{2^x} dx$