Name: _____

HW 3.1 Extrema on an Interval and 3.2 Rolle's Theomem and the Mean Value Theorem

Section 3.1

Find any critical numbers of the function.

13. $f(x) = x^2(x-3)$

16. $f(x) = \dfrac{4x}{x^2+1}$

18. $f(\theta) = 2\sec\theta + \tan\theta$

Locate the absolute extrema of the function on the closed interval.

19. $f(x) = 2(3-x), [-1,2]$

21. $f(x) = -x^2 + 3x, [0,3]$

23. $f(x) = x^3 - \dfrac{3}{2}x^2, [-1,2]$

25. $y = 3x^{2/3} - 2x, [-1,1]$

27. $g(t) = \dfrac{t^2}{t^2+3}, [-1,1]$

33. $f(x) = \cos \pi x, \left[0, \dfrac{1}{6}\right]$

Section 3.2

Determine wheter Rolle's Theorem can be applied to f on the closed interval [a,b]. If Rolle's Theorem can be applied, find all values of c in the open interval (a,b) such that f'(c)=0.

12. $f(x) = x^2 - 5x + 4, [1,4]$

14. $f(x) = (x-3)(x+1)^2, [-1,3]$

17. $f(x) = \dfrac{x^2 - 2x - 3}{x+2}, [-1,3]$

22. $f(x) = \cos 2x, \left[\dfrac{-\pi}{12}, \dfrac{\pi}{6}\right]$

Determine whether the Mean Value Theorem can be applied to f on the closed interval [a,b]. If the Mean Value Theorem can be applied, find all values of c in the open interval (a,b) such that $f'(c) = \dfrac{f(b)-f(a)}{b-a}$.

40. $f(x) = x(x^2 - x - 2), [-1,1]$

42. $f(x) = \dfrac{x+1}{x}, \left[\dfrac{1}{2}, 2\right]$

43. $f(x) = \sqrt{2-x}, [-7,2]$

46. $f(x) = 2\sin x + \sin 2x, [0,\pi]$