Please submit your Homework 4 assignment here as a Word or PDF attachment.

Homework 4 (all problems are in the textbook):

***page 167 # 2, 5, 11, 20***

find the value of the derivative (if it exists) at each indicated extremum.

2) $f\left(x\right)=\cos(\frac{πx}{2})$

find the value of the derivative (if it exists) at each indicated extremum.

5) $f\left(x\right)=\left(x+2\right)^{\frac{2}{3}}$

Find the critical numbers of the function.

11) $f\left(x\right)=x^{3}-3x^{2}$

20) find the absolute extrema of the function on the closed interval $h\left(x\right)=5-x^{2},[-3,1]$

***page 174-175 # 35 (not part d), 36 (not part d), 40***

35) consider the graph of the function $f\left(x\right)=-x^{2}+5$

(a) find the equation of the line joining the points (-1,4) and (2,1)

(b) Use the mean value theorem to determine a point C in the interval (-1,2) such that the tangent line at C is parallel to the secant line.

(c) find the equation of the tangent line through C.

36) consider the graph of the function $f\left(x\right)=-x^{2}+5$

(a) find the equation of the secant line joining the points (-2,-6) and (4,0)

(b) use the mean value theorem to determine a point C in the interval (-2,4) such that the tangent line at C is parallel to the secant line.

(c) find the equation of the line through C.

40) determine whether the mean value theorem can be applied to the F on 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 $f\left(c\right)=\frac{f\left(b\right)-f\left(a\right)}{b-a}$ if the mean value theorem cannot be applied explain why not.

(a) $f\left(x\right)=x^{4}-8x\left[0,2\right]$

***page 183 # 17 (not part d), 24 (not part d), 33 (not part d)***

(a) find the critical numbers of *f* (if any) (b) find the open interval(s) on which the function is increasing or decreasing, (c) apply the first derivative test to identify all relative extrema.

17) $f\left(x\right)=x^{2}-4x$

(a) find the critical numbers of *f* (if any) (b) find the open interval(s) on which the function is increasing or decreasing, (c) apply the first derivative test to identify all relative extrema.

24) $f\left(x\right)=\left(x+2\right)^{2}\left(x-1\right)$

(a) find the critical numbers of *f* (if any) (b) find the open interval(s) on which the function is increasing or decreasing, (c) apply the first derivative test to identify all relative extrema.

33) $f\left(x\right)=2x+\frac{1}{x}$

***page 192 # 17, 24, 32, 39***

17) find the points of inflection and discuss the concavity of the graph of the function, $f\left(x\right)=\frac{1}{2}x^{4}+2x^{3}$

24) find the points of inflection and discuss the concavity of the graph of the function. $f\left(x\right)=\frac{x+3}{\sqrt{x}}$

32) find all relative extrema. Use the second derivative test where applicable. $f\left(x\right)=x^{2}+3x-8$

39) find all relative extrema. Use the second derivative test where applicable. $f\left(x\right)=x+\frac{4}{x}$

***page 202 # 19, 22, 31, 34***

19) find the limit $\lim\_{x\to \infty }\left(4+\frac{3}{x}\right)$

22) find the limit $\lim\_{x\to -\infty }\frac{4x^{2}+5}{x^{2}+3}$

31) find the limit $\lim\_{x\to \infty }\frac{\sqrt{x^{2}-1}}{2x-1}$

34) find the limit $\lim\_{x\to \infty }\frac{2x}{\left(x^{6}-1\right)^{^{1}/\_{3}}}$

***page 212 # 13***

analyze and sketch a graph of the function. Label any intercepts, relative extrema, points of inflection, and asymptotes. Use a graphing utility to verify your results.

$y=\frac{x^{2}-6x+12}{x-4}$

***page 220 #19***

a farmer plans to fence a rectangular pasture adjacent to a river the pasture must contain 245,000 square meters in order to provide enough grass for the herd. No fencing is needed along the river. What dimension will require the least amount of fencing?