MAC2311 Quiz 8 Spring 2021

SHOW ALL WORK.

1. What value of c satisfies the Mean Value Theorem for $f(x) = 2x^3 - 4x$ on $[0,2]$. Give exact answers.

$c = \frac{2\sqrt{3}}{3}$ work on other page

2. Use the closed interval method to find the coordinates of the Absolute Max and the Absolute min of $f(x) = 5\cos x - 5\sin x$ on $\left[0, \frac{3\pi}{2}\right]$. Give exact answers.

Max = 5

Min =

Mean Value Theorem

f continuous over $[a,b]$

differentiable over (a,b)

$$\frac{f(b)-f(a)}{b-a} = f'(c)$$

$f(0)=0$

$f(2)=2(2)^3-4(2)$

$f(2)=16-8$

$f(2)=8$

$f'(c)=\frac{8-0}{2-0}$

$f'(c)=4$

$f'(x)=2(3)x^2-4$

$f'(x)=6x^2-4$

$4=6x^2-4$

$\frac{8}{6}=\frac{6x^2}{6}$

$\sqrt{\frac{4}{3}}=\sqrt{x^2}$

$x=\sqrt{4/3}$

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

$f(x) = 5\cos x - 5\sin x$

$f'(x) = -5\sin x - 5\cos x$

$0 = -5\sin x - 5\cos x$

$f(0) = 5(1) - 5(0)$

$f(0) = 5$

$f\left(\frac{3\pi}{2}\right) = 5(0) - 5(-1)$

$f\left(\frac{3\pi}{2}\right) = 5$

$f\left(\frac{3\pi}{4}\right) =$