Practice Quiz 2 Sec 4.1 to 4.2

version 2 Key

Name____________________________

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

Find the absolute extreme values of the function on the interval.

1) $g(x) = -x^2 + 11x - 24, \ 3 \le x \le 8$

2) $f(x) = \tan x, \ -\frac{\pi}{4} \le x \le \frac{\pi}{4}$

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the extreme values of the function and where they occur. Show the analysis that leads to you r answer (calculus)

3) $y = \dfrac{x + 1}{x^2 + 3x + 3}$ 3) ________

A) None

B) The maximum is 3 at $x = 0$; the minimum is $\frac{1}{3}$ at $x = -2$.

C) The maximum is $\frac{1}{3}$ at $x = 0$; the minimum is -1 at $x = -2$.

D) The maximum is $-\frac{1}{3}$ at $x = 0$; the minimum is 1 at $x = -2$.

ESSAY. Write your answer in the space provided or on a separate sheet of paper.

Find the anti-derivate that passes thru the given point.

4) $\dfrac{dr}{dt} = 3t + \sec^2 t, \ r(-\pi) = -2$

Find the value or values of c that satisfy the equation $\dfrac{f(b) - f(a)}{b - a} = f'(c)$ in the conclusion of the Mean Value Theorem for the function and interval.

5) $f(x) = x + \dfrac{45}{x}, \ [5, 9]$

My work

(1) $g'(x) = -2x + 11$

$0 = -2x + 11$

$x = \frac{11}{2}$

x	g		
3	$-9 + 33 - 24$		0
$\frac{11}{2}$	$-\frac{121}{4} + \frac{121}{2} - 24$	$\frac{121}{4} - \frac{96}{4}$	$\frac{25}{4}$ max @ $\frac{11}{2}$
8	$-64 + 66 - 24$	$-88 + 66$	-22 min @ 8

(2) $g' = \sec^2 x = 0$

never

x	y	
$-\frac{\pi}{4}$	-1	min
$\frac{\pi}{4}$	1	max

(3) $\frac{x^2+3x+3-(x+1)(2x+3)}{(x^2+3x+3)^2}$ $\quad \frac{x^2+3x+3-2x^2-5x-3}{(x^2+3x+3)^2}$

$\frac{-x^2-2x}{(x^2+3x+3)^2}$ $\quad -x(x+2)$ $\quad (0, \frac{1}{3})$ $\quad \frac{-1}{4-6+3}$

0 and -2

$(-2, -1)$

$\cancel{9-4(1)(3)}$

C

$3t + \sec^2 t$

$F(t) = \frac{3}{2}t^2 + \tan t + C \quad (-\pi, -2)$

$-2 = \frac{3}{2}\pi^2 + 0 + C$

$-2 - \frac{3}{2}\pi^2 = C$

$F(t) = \frac{3}{2}t^2 + \tan t - 2 - \frac{3}{2}\pi^2$

(5) $f(9) = 9 + 5 = 14$

$f(5) = 5 + 9 = 14$

Slope $= 0$

$1 - \frac{45}{x^2} = 0$

$1 = \frac{45}{x^2}$

$\cancel{x^2 = 45}$

$x = 3\sqrt{5}$