Calculus

Name_____ ID: 1

MVT and AVT

Date_____ Period____

For each problem, find the average value of the function over the given interval.

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

$-\ln 4 \approx -1.386$

2) $f(x) = x^3 - 3x^2 + 4$; $[-1, 3]$

2

3) $f(x) = -2x^2 - 16x - 34$; $[-5, -3]$

$-\dfrac{8}{3} \approx -2.667$

4) $f(x) = -x^5 + 4x^3 - 3x - 3$; $[-2, 1]$

-3

For each problem, find the values of *c* that satisfy the Mean Value Theorem for Integrals.

5) $f(x) = \dfrac{2}{(x-1)^2}$; $[2, 5]$

3

6) $f(x) = 5(2x-2)^{\frac{1}{2}}$; $[1, 2]$

$\dfrac{13}{9} \approx 1.444$

7) $f(x) = 3x^{\frac{1}{2}}$; $[0, 3]$

$\dfrac{4}{3} \approx 1.333$

8) $f(x) = x + 1$; $[-7, -3]$

-5

For each problem, find the average value of the function over the given interval. Then, find the values of *c* that satisfy the Mean Value Theorem for Integrals.

9) $f(x) = 2x^{\frac{1}{2}}$; $[0, 1]$

Average value of function: $\dfrac{4}{3} \approx 1.333$

Values that satisfy MVT: $\dfrac{4}{9} \approx 0.444$

10) $f(x) = 3(x+3)^{\frac{1}{2}}$; $[-3, -2]$

Average value of function: 2

Values that satisfy MVT: $-\dfrac{23}{9} \approx -2.556$

11) $f(x) = -2x^2 - 4x + 2$; $[-3, 1]$

Average value of function: $\dfrac{4}{3} \approx 1.333$

Values that satisfy MVT: $\dfrac{-3-2\sqrt{3}}{3} \approx -2.155$, $\dfrac{-3+2\sqrt{3}}{3} \approx 0.155$

12) $f(x) = 2x$; $[-1, 3]$

Average value of function: 2

Values that satisfy MVT: 1