

Nombre: _____

AP Calculus AB: 8.6 Average Value

Calculators allowed

1. What is the average value of the function $f(x) = \sqrt[3]{x^2 + 5x}$ over the interval $[2,7]$? (Ans: 3.464)

$$\frac{\int_2^7 f(x) dx}{7-2} = 3.464$$

2. What is the average velocity of a particle over the interval $[-1,3]$ if the particles velocity is given by the function $v(t) = \frac{\sqrt[3]{4x^2}}{5x}$? (Ans: 0.129)

$$\frac{\int_{-1}^3 v(t) dt}{3 - -1} = \boxed{.129}$$

- b) What is the particle's average speed? (Ans: 0.367)

$$\frac{\int_{-1}^3 |v(t)| dt}{3 - -1} = \boxed{.367}$$

- c) What is the distance traveled by the particle on the same interval? (Ans: 1.467)

$$\int_{-1}^3 |v(t)| dt = \boxed{1.467}$$

- d) if at time $t=1$ the particle had a position $x(t)=-5$, what is the particle's position at $t=3$ (Ans: -4.486)

$$-5 + \int_1^3 v(t) dt = \boxed{-4.486}$$

3. Given the function of a moving particle is $x(t) = \sqrt{\ln(2x^3)}$, find the average velocity on the interval $[4,7]$. (Ans: 0.118)

$$\frac{x(7) - x(4)}{7-4} = \boxed{.118}$$

4. Find the average value of $y = \frac{e^{5x}}{10-x}$ on the interval $[1, \ln(1)]$. (Ans: 3.208)

$$\frac{\int_1^{\ln(1)} \frac{e^{5x}}{10-x} dx}{\ln(1) - 1} = \boxed{3.208}$$