Name_____

Calculus Practice: Average Value of a Function 2a

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

1) $f(x) = -\dfrac{3}{x}$; $[-4, -2]$

  A) $\dfrac{-3\ln 2 + 4\ln 4}{7} \approx 0.495$

  B) $\dfrac{-3\ln 2 + 3\ln 4}{2} \approx 1.04$

  C) $\dfrac{\ln 2 + 11\ln 4}{2} \approx 7.971$

  D) $\dfrac{-3\ln 2 + 6\ln 4}{2} \approx 3.119$

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

  A) $\ln 3 + 3\ln 2 \approx 3.178$
  B) $\ln 3 + 7\ln 5 \approx 12.365$
  C) $\ln 3 \approx 1.099$
  D) $\ln 3 - \ln 2 \approx 0.405$

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

  A) $\dfrac{5\ln 5 - 5\ln 8}{3} \approx -0.783$

  B) $\dfrac{5\ln 5 - 5\ln 2}{3} \approx 1.527$

  C) $\dfrac{9\ln 2}{7} \approx 0.891$

  D) $\dfrac{12\ln 5 + 2\ln 2}{3} \approx 6.9$

4) $f(x) = \dfrac{5}{x - 3}$; $[4, 5]$

  A) $13\ln 8 \approx 27.033$
  B) $5\ln 2 \approx 3.466$
  C) $7\ln 5 \approx 11.266$
  D) $2\ln 2 \approx 1.386$

5) $f(x) = -2e^x$; $[-2, 1]$

  A) $\dfrac{-e^3 + 1}{6e^2} \approx -0.43$

  B) $\dfrac{7e^3 + 2}{3e^2} \approx 6.433$

  C) $\dfrac{-2e^3 + 2}{3e^2} \approx -1.722$

  D) $\dfrac{e^3 + 7}{3e^2} \approx 1.222$

6) $f(x) = -3e^x$; $[-3, 0]$

  A) $\dfrac{5e^3 + 1}{3e^3} \approx 1.683$

  B) $\dfrac{e^3 + 1}{2e^3} \approx 0.525$

  C) $\dfrac{-e^3 + 1}{e^3} \approx -0.95$

  D) $\dfrac{-e^3 + 3}{e^3} \approx -0.851$

7) $f(x) = -e^x$; $[-1, 1]$

  A) $\dfrac{6e^2 + 1}{2e} \approx 8.339$

  B) $\dfrac{-e^2 + 1}{2e} \approx -1.175$

  C) $\dfrac{-e^2 + 2}{3e} \approx -0.661$

  D) $\dfrac{8e^2 + 1}{2e} \approx 11.057$

8) $f(x) = -3e^{2x + 4}$; $[-5, -2]$

  A) $\dfrac{-e^6 + 1}{2e^6} \approx -0.499$

  B) $\dfrac{8e^6 + 1}{e^6} \approx 8.002$

  C) $\dfrac{-e^6 + 8}{2e^6} \approx -0.49$

  D) $\dfrac{-e^6 + 10}{2e^6} \approx -0.488$

9) $f(x) = \csc x \cot x$; $[\frac{\pi}{2}, \frac{3\pi}{4}]$

   A) $\dfrac{-4\sqrt{2} + 4}{9\pi} \approx -0.059$

   B) $\dfrac{-4\sqrt{2} + 9}{\pi} \approx 1.064$

   C) $\dfrac{-4\sqrt{2} + 4}{\pi} \approx -0.527$

   D) $\dfrac{22}{\pi} \approx 7.003$

10) $f(x) = -2\sec^2 x$; $[-\frac{\pi}{4}, \frac{\pi}{4}]$

   A) $\dfrac{3}{8\pi} \approx 0.119$

   B) $-\dfrac{8}{\pi} \approx -2.546$

   C) $\dfrac{5}{\pi} \approx 1.592$

   D) $-\dfrac{8}{11\pi} \approx -0.231$

11) $f(x) = -\csc^2 x$; $[\frac{\pi}{2}, \frac{3\pi}{4}]$

   A) $-\dfrac{4}{11\pi} \approx -0.116$

   B) $-\dfrac{1}{\pi} \approx -0.318$

   C) $-\dfrac{4}{9\pi} \approx -0.141$

   D) $-\dfrac{4}{\pi} \approx -1.273$

12) $f(x) = 2\cos x$; $[-\frac{\pi}{4}, \frac{\pi}{4}]$

   A) $\dfrac{11\sqrt{7}}{\pi} \approx 9.264$

   B) $\dfrac{4\sqrt{2}}{\pi} \approx 1.801$

   C) $\dfrac{8\sqrt{2}}{\pi} \approx 3.601$

   D) $\dfrac{3\sqrt{2}}{\pi} \approx 1.35$

13) $f(x) = \dfrac{1}{x\sqrt{x^2 - 4}}$; $[\frac{4\sqrt{3}}{3}, 4]$

   A) $\dfrac{5\pi}{16} \approx 0.982$

   B) $\dfrac{3\pi + \pi\sqrt{3}}{96} \approx 0.155$

   C) $\dfrac{9\pi + \pi\sqrt{3}}{105} \approx 0.321$

   D) $\dfrac{12\pi + 7\pi\sqrt{3}}{96} \approx 0.789$

14) $f(x) = \dfrac{1}{1 + x^2}$; $[\frac{\sqrt{3}}{3}, \sqrt{3}]$

   A) $\dfrac{\pi\sqrt{3}}{12} \approx 0.453$

   B) $\dfrac{2\pi\sqrt{3}}{11} \approx 0.989$

   C) $\dfrac{\pi}{4} \approx 0.785$

   D) $\dfrac{8\pi\sqrt{3}}{21} \approx 2.073$

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

   A) $\dfrac{\pi\sqrt{2} + 4\pi}{3} \approx 5.67$

   B) $\dfrac{8\pi\sqrt{2} + \pi}{6} \approx 6.447$

   C) $\dfrac{\pi\sqrt{2} + \pi}{6} \approx 1.264$

   D) $\dfrac{7\pi\sqrt{2} + \pi}{6} \approx 5.707$

16) $f(x) = \dfrac{1}{\sqrt{9 - x^2}}$; $[\frac{3}{2}, \frac{3\sqrt{2}}{2}]$

   A) $\dfrac{\pi\sqrt{6} + \pi}{18} \approx 0.602$

   B) $\dfrac{5\pi\sqrt{2} + 7\pi}{18} \approx 2.456$

   C) $\dfrac{\pi\sqrt{2} + \pi}{18} \approx 0.421$

   D) $\dfrac{\pi\sqrt{2} + \pi}{8} \approx 0.948$

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