

Chapter 5 Calculus Practice Test

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Express the limit as a definite integral.

$$1) \lim_{n \rightarrow \infty} \sum_{k=1}^n (3c_k^2 - 6c_k + 16) \Delta x_k, \quad [-9, 2] \quad 1) \underline{\hspace{2cm}}$$

Use areas to evaluate the integral.

$$2) \int_a^{\sqrt{2}a} x \, dx, \quad a > 0 \quad 2) \underline{\hspace{2cm}}$$

$$3) \int_a^b 8x \, dx, \quad 0 < a < b \quad 3) \underline{\hspace{2cm}}$$

Express the desired quantity as a definite integral and evaluate the integral.

$$4) \text{ Find the distance of a train moving at 50 mph from 6:00 A.M. to 9:30 A.M.} \quad 4) \underline{\hspace{2cm}}$$

Find dy/dx.

$$5) \int_{\pi/4}^{\cot x} \csc^2 t \, dt \quad 5) \underline{\hspace{2cm}}$$

$$6) \int_0^x \sqrt{4t+7} \, dt \quad 6) \underline{\hspace{2cm}}$$

$$7) \int_0^{9 \ln x} e^t \, dt \quad 7) \underline{\hspace{2cm}}$$

Construct a function of the form $y = \int_a^x f(t) \, dt + C$ that satisfies the given conditions.

$$8) \frac{dy}{dx} = \csc x, \text{ and } y = -8 \text{ when } x = 4 \quad 8) \underline{\hspace{2cm}}$$

Evaluate the integral.

$$9) \int_2^{-1} 3^x \, dx \quad 9) \underline{\hspace{2cm}}$$

$$10) \int_{1/5}^3 \left(5 - \frac{1}{x} \right) dx \quad 10) \underline{\hspace{2cm}}$$

11) $\int_0^{\pi/2} 9 \sin x \, dx$

11) _____

Find the total area of the region between the curve and the x-axis.

12) $y = 2x - x^2; 0 \leq x \leq 2$

12) _____

13) $y = 2x + 7; 1 \leq x \leq 5$

13) _____

Use the Trapezoidal Rule to estimate the integral.

14) $\int_0^2 4x^2 \, dx, n = 4$

14) _____

15) $\int_{-\pi}^0 \sin x \, dx, n = 4$

15) _____

Use Simpson's Rule with $n = 4$ steps to estimate the integral.

16) $\int_0^2 4x^2 \, dx$

16) _____

17) $\int_{-\pi}^0 \sin x \, dx$

17) _____

Answer Key

Testname: CHAPTER 5 CALCULUS PRACTICE TEST

$$1) \int_{-9}^2 (3x^2 - 6x + 16) dx$$

$$2) \frac{1}{2}a^2$$

$$3) 4(b^2 - a^2)$$

$$4) \int_0^{3.5} 50 dt, 175 \text{ miles}$$

$$5) -\csc^2 x \csc^2 (\cot x)$$

$$6) \sqrt{4x + 7}$$

$$7) 9x^8$$

$$8) y = \int_4^x \csc t dt - 8$$

$$9) \frac{-28}{3 \ln 3}$$

$$10) 14 - \ln 15$$

$$11) 9$$

$$12) \frac{4}{3}$$

$$13) 52$$

$$14) 11$$

$$15) -\frac{1 + \sqrt{2}}{4} \pi$$

$$16) \frac{32}{3}$$

$$17) -\frac{1 + 2\sqrt{2}}{6} \pi$$