

Name _____

Calculus Chapter 6 Practice Test

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

Evaluate the integral.

1) $\int x^6(x^7 - 4)^4 dx$ 1) _____

2) $\int \frac{dx}{x \ln x^4}$ 2) _____

Evaluate the definite integral.

3) $\int_0^{\pi/2} x^2 \sin 3x dx$ 3) _____

Give your answer in exact form.

Evaluate the integral.

4) $\int x^3 \cos 4x dx$ 4) _____

Use separation of variables to solve the initial value problem.

5) $\frac{dy}{dx} = \frac{22}{x}$ and $y = 21$ when $x = 1$ 5) _____

6) $y' = \frac{5x^2}{\sqrt{y}}$ and $y = 1$ when $x = 0$ 6) _____

Find the solution of the differential equation $dy/dt = ky$, k a constant, that satisfies the given conditions.

7) $y(0) = 350$, $y(40) = 119$ 7) _____

Evaluate the integral.

8) $\int \frac{200 dx}{x^3 - 25x}$ 8) _____

9) $\int \frac{2x + 23}{x^2 + 11x + 28} dx$ 9) _____

Solve the differential equation.

10) $\frac{dy}{dx} = \frac{x^5}{x^3 - 16x}$ 10) _____

Answer Key

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$$1) \frac{(x^7 - 4)^5}{35} + C$$

$$2) \frac{1}{4} \ln(\ln x^4) + C$$

$$3) -\frac{2}{27} - \frac{\pi}{9}$$

$$4) \frac{1}{4}x^3 \sin 4x + \frac{3}{16}x^2 \cos 4x - \frac{3}{32}x \sin 4x - \frac{3}{128} \cos 4x + C$$

$$5) y = 22 \ln x + 21$$

$$6) y = \left(\frac{5x^3 + 2}{2} \right)^{2/3}$$

$$7) y = 350e^{-0.027t}$$

$$8) \ln \left| \frac{(x-5)^4(x+5)^4}{x^8} \right| + C$$

$$9) \ln \left| \frac{(x+4)^5}{(x+7)^3} \right| + C$$

$$10) y = \frac{x^3}{3} + 16x + 32 \ln \left| \frac{x-4}{x+4} \right| + C$$