

Exam 4

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Evaluate.

1) $\int \frac{156}{x} dx$

A) $156 \ln |x| + C$

B) $78x^{-2} + C$

C) $\ln \left| \frac{x}{156} \right| + C$

D) $156x + C$

2) $\int 12x^3 \sqrt{x} dx$

A) $\frac{11}{5}x^{9/2} + C$

B) $\frac{24}{7}x^{9/2} + C$

C) $\frac{8}{3}x^{9/2} + C$

D) $\frac{2}{9}x^{9/2} + C$

3) $\int 8e^{0.2x} dx$

A) $8e^{0.2x} + C$

B) $40e^{0.2x} + C$

C) $\frac{8e^{0.2x+1}}{0.2x+1} + C$

D) $1.6e^{0.2x} + C$

Evaluate the indefinite integral.

4) $\int (x - 6)^2 x^2 dx$

A) $x^5 - 12x^4 + 36x^3 + C$

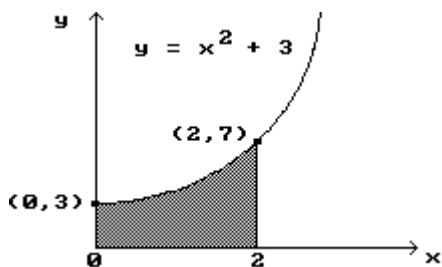
B) $\frac{x^5}{5} - 3x^4 + 12x^3 + C$

C) $4x^3 - 3x^4 + 12x^2 + C$

D) $\frac{x^5}{4} - 4x^4 + 18x^3 + C$

Find the shaded area under the given curve.

5)



A) $\frac{26}{3}$

B) $\frac{22}{3}$

C) $\frac{25}{3}$

D) $\frac{23}{3}$

Evaluate.

6) $\int_0^b 10e^x dx$

A) $10e^b$

B) $10e^b - 10$

C) $10e^b - 1$

D) $\frac{10e^b + 1}{b + 1} - \frac{e}{2}$

Name _____

Solve the problem.

7) Suppose that $\int_{-4}^{-1} g(t) dt = -4$. Find $\int_{-4}^{-1} \frac{g(x)}{-4} dx$ and $\int_{-1}^{-4} -g(t) dt$.

- A) 0; -4 B) -1; 4 C) 1; 4 D) 1; -4

8) Suppose that g is continuous and that $\int_1^7 g(x) dx = 2$ and $\int_1^{10} g(x) dx = 18$. Find $\int_{10}^7 g(x) dx$.

- A) 16 B) 20 C) -20 D) -16

Evaluate the integral.

9) $\int_1^2 \left(t + \frac{1}{t} \right)^2 dx$

- A) $\frac{29}{6}$ B) $\frac{5}{6}$ C) $\frac{37}{6}$ D) $\frac{15}{2}$

Solve the problem.

10) Given the velocity and initial position of a body moving along a coordinate line at time t , find the body's position at time t .

$v = -16t + 2, s(0) = 6$

- A) $s = -16t^2 + 2t + 6$ B) $s = -8t^2 + 2t + 6$ C) $s = -8t^2 + 2t - 6$ D) $s = 8t^2 + 2t - 6$

Evaluate the integral.

11) $\int_{\ln 7}^{\ln 6} e^x dx$

- A) -1 B) 1 C) 13 D) 12

Evaluate using the substitution method.

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

- A) $\frac{1}{8}(\ln x^4)^2 + C$ B) $\frac{1}{4}(\ln x^4)^2 + C$ C) $\frac{1}{\ln x^4} + C$ D) $\frac{1}{2}(\ln x^4)^2 + C$

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SHORT ANSWER. Show all work CLEARLY in the space provided. Give EXACT answers, unless otherwise indicated

Perform the integration using substitution.

13) $\int \frac{1}{x(\ln x^3)} dx$

Answer:

.....

Find the area of the region enclosed between the two curves. Give exact answer.

14) $y = x^3$ and $y = 64x$

Area:

.....

Name _____

Solve the problem.

15) Evaluate $\int \frac{t^2}{\sqrt{16t^3 + 5}} dt$.

Answer:

.....

16) Suppose that an object's acceleration function is given by $a(t) = 4t + 7$. The object's initial velocity, $v(0)$, is 2, and the object's initial position, $s(0)$, is 8. Find $v(t)$ and $s(t)$.

$v(t) =$.
.....

$s(t) =$.
.....

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17) Find the area under the curve $y = \frac{1}{e^x} + \frac{1}{x-2}$ between $x = 3$ and $x = 5$.

Give your answer in the form $e^a - e^b + c$ (no approximations).

Area =

Answer Key

- 1) A
- 2) C
- 3) B
- 4) B
- 5) A
- 6) B
- 7) D
- 8) D
- 9) A
- 10) B
- 11) A
- 12) A
- 13) $\frac{1}{3} \ln |\ln x^3| + C$
- 14) 2048
- 15) $\frac{\sqrt{16t^3 + 5}}{24} + C$
- 16) $s(t) = \frac{2}{3}t^3 + \frac{7}{2}t^2 + 2t + 8$
- 17) $e^{-3} - e^{-5} + \ln 3$