

## 5.6: Definite Integral Substitutions

## 7.1: The Logarithm Defined as an Integral

Use the substitution formula to evaluate the integral.

$$1) \int_{-1}^0 \frac{2t}{(3+t^2)^3} dt$$

A)  $-\frac{7}{288}$       B)  $\frac{7}{288}$       C)  $-\frac{7}{72}$       D)  $-\frac{7}{144}$       1) A

$$2) \int_1^4 \frac{4-\sqrt{x}}{\sqrt{x}} dx$$

A)  $-\frac{5}{2}$       B)  $\frac{5}{2}$       C) 10      D) 5      2) D

$$3) \int_0^{\pi} (1 + \cos 9t)^2 \sin 9t dt$$

A)  $\frac{1}{9}$       B)  $\frac{1}{27}$       C)  $\frac{8}{27}$       D)  $\frac{8}{3}$       3) C

$$4) \int_0^{\pi/2} \frac{\cos x}{(2 + 4 \sin x)^3} dx$$

A)  $-\frac{3}{32}$       B)  $-\frac{1}{9}$       C)  $\frac{1}{36}$       D)  $\frac{1}{9}$       4) C

$$5) \int_0^{\pi/16} (1 + e^{\tan 4x}) \sec^2 4x dx$$

A)  $\frac{e}{4}$       B)  $4e$       C)  $-\frac{e}{4}$       D)  $e$       5) A

$$6) \int_0^{\pi/20} 20 \tan 5x dx$$

A)  $2 \ln 3$       B)  $4 \ln 2$       C)  $2 \ln 2$       D)  $-2 \ln 2$       6) C

$$7) \int_0^1 \frac{dx}{\sqrt{64-x^2}}$$

A)  $8 \cos^{-1} \frac{1}{8}$       B)  $\cos^{-1} \frac{1}{8}$       C)  $\sin^{-1} \frac{1}{8}$       D)  $\frac{1}{8} \sin^{-1} \frac{1}{8}$       7) C

$$8) \int_{2/7}^{\sqrt{3}/7} \frac{dt}{t\sqrt{49t^2 - 1}}$$

A)  $-\frac{\pi}{6}$

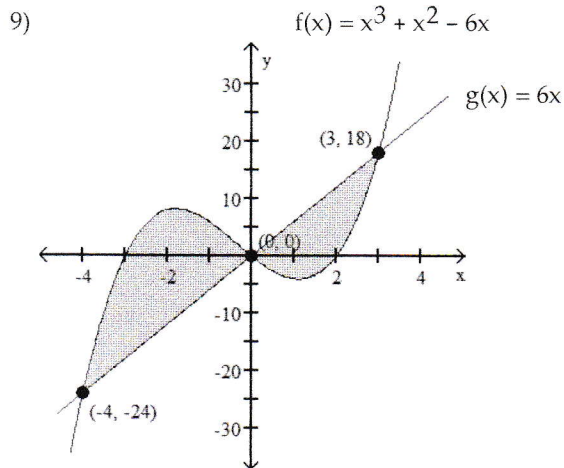
B)  $\frac{\pi}{6}$

C)  $\frac{\pi}{12}$

D)  $-\frac{\pi}{12}$

8) D

Find the area of the shaded region.



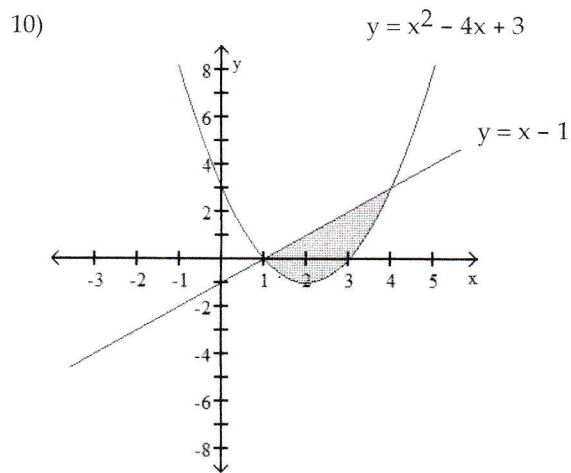
A)  $\frac{343}{12}$

B)  $\frac{768}{12}$

C)  $\frac{81}{12}$

D)  $\frac{937}{12}$

9) D



A) 3

B)  $\frac{9}{2}$

C)  $\frac{25}{6}$

D)  $\frac{41}{6}$

10) B

Evaluate the integral.

11)  $\int \frac{6 dx}{2 + 7x}$

A)  $\ln|-2 - 7x| + C$

B)  $\frac{6}{7} \ln|-2 - 7x| + C$

C)  $\frac{4}{7} \ln|2 + 7x| + C$

D)  $-6 \ln|-2 - 7x| + C$

11) B

$$12) \int_2^3 \frac{x^4 + 1}{x^5 + 5x} dx$$

$$A) \frac{1}{5} \ln \left| \frac{43}{7} \right|$$

$$B) \frac{2}{3} \ln \left| \frac{3}{2} \right|$$

$$C) \frac{1}{5} \ln \left| \frac{38}{249} \right|$$

$$D) \frac{1}{5} \ln \left| \frac{2}{3} \right|$$

12) A

$$13) \int \frac{\cos x dx}{1 + 6 \sin x}$$

$$A) \ln |1 + 6 \sin x| + C$$

$$B) \frac{1}{6} \ln |1 + 6 \sin x| + C$$

$$C) 6 \ln |1 + 6 \sin x| + C$$

$$D) 6 \sin x + C$$

13) B