

Fall 2012

10. Compute the definite integral $\int_0^{\pi} \sin^3(x) \cos^4(x) dx$.

- (a) 0 (b) $\frac{4}{3}$ (c) $\arccos \frac{1}{3}$ (d) $\frac{1}{\sqrt{2}}$ (e) $\frac{4}{35}$ (f) $\frac{6}{\sqrt{6}}$

Spring 2012

10. The integral

$$\int_0^1 \frac{dx}{(x^2 + 4)^{3/2}}$$

Is equal to

A) $\frac{1}{2} \arctan\left(\frac{1}{2}\right)$

B) $-\frac{2}{\sqrt{5}} + 1$

C) $\frac{1}{4} \ln\left(\frac{\sqrt{5}}{2}\right)$

D) $\frac{1}{2\sqrt{5}} - \frac{1}{4}$

E) $\frac{1}{4\sqrt{5}}$

F) diverges

Fall 2011

8. The region bounded by $y = \frac{x}{\sqrt[4]{(x^2 + 3)^5}}$, the x -axis, and $0 \leq x \leq 1$, is rotated about the x -axis. The volume of the resulting solid is equal to:

- (A) $\frac{\pi}{6}$ (B) $\frac{1}{\sqrt{2}}$ (C) $\frac{e}{2}$ (D) $\frac{\pi}{4}$ (E) $\frac{e}{2}$ (F) $\sec 2$ (G) $\frac{1}{2}$ (H) $\frac{\pi}{72}$

Spring 2011

6. Evaluate $\int_0^1 \sin^3\left(\frac{\pi}{2}x\right) dx$.

- (a) $2\pi/3$ (b) $4\pi/3$ (c) $2/3\pi$ (d) $1/3\pi$ (e) $3/4\pi$ (f) $4/3\pi$

Fall 2010

2. Find the average value of the function $\sin^3(x) \cos^2(x)$ over the interval $[0, \pi]$.

- (A) $\frac{4}{15\pi}$ (B) $\frac{2}{\pi}$ (C) $\frac{1}{8}$ (D) $\frac{4}{35\pi}$ (E) $-\frac{4}{15\pi}$ (F) $\frac{1}{2\pi}$ (G) $\frac{4}{15}$ (H) $\frac{8}{\pi}$
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Fall 2007

7. Evaluate: $\int_0^2 \sqrt{16-x^2} dx$

a) $\frac{\sqrt{3}}{2} + \frac{8\pi}{2}$

b) $\sqrt{3} + \frac{8\pi}{3}$

c) $2\sqrt{3} + \frac{8\pi}{3}$

d) $\frac{\sqrt{3}}{2} + \frac{4\pi}{3}$

e) $\sqrt{3} + \frac{4\pi}{3}$

f) $2\sqrt{3} + \frac{4\pi}{3}$

Spring 2007

18. Evaluate the integral.

$$\int_0^{1/2} \sqrt{1-4x^2} dx$$

A.) $\pi/8$

B.) $\pi/6$

C.) $\pi/4$

D.) $\pi/3$

E.) $\pi/2$

F.) π

Fall 2006

5. Evaluate the integral.

$$\int_0^1 \frac{dx}{(4-x^2)^{3/2}}$$

- (A) $\frac{\sqrt{3}}{2}$ (B) $\frac{\sqrt{3}}{4} - \frac{1}{2}$ (C) $\frac{\sqrt{3}}{36} - \frac{1}{32}$ (D) $\frac{\sqrt{3}}{12}$ (E) $\frac{\sqrt{3}}{6} - \frac{1}{4}$ (F) $\frac{\sqrt{3}}{8} - \frac{1}{4}$

ANSWERS:

FALL 2012 # 10: E

Spring 2012 # 10: E

FALL 2011 # 8: H

SPRING 2011 # 6: F

FALL 2010 # 2: A

FALL 2007 # 7: F

SPRING 2007 # 18: A

FALL 2006 # 5: D