

This print-out should have 20 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

001 10.0 points

Evaluate the definite integral

$$I = \int_1^2 5 \ln(2x) dx.$$

1. $I = 5 \ln 2$
2. $I = 5 \ln 8$
3. $I = 5(\ln 2 - 1)$
4. $I = 5(\ln 4 - 1)$
5. $I = 5(\ln 8 - 1)$
6. $I = 5 \ln 4$

002 10.0 points

Determine the indefinite integral

$$I = \int 2x \ln x dx.$$

1. $I = 2x^2 \ln x - x^2 + C$
2. $I = x^2 \ln x - \frac{1}{2}x^2 + C$
3. $I = x^2 \ln x - 2x^2 + C$
4. $I = 2x^2 \ln x + \frac{1}{2}x^2 + C$
5. $I = 2x^2 \ln x - \frac{1}{2}x^2 + C$
6. $I = x^2 \ln x + \frac{1}{2}x^2 + C$

003 10.0 points

Evaluate the definite integral

$$I = \int_1^e 5x^3 \ln(x) dx.$$

$$1. I = \frac{5}{4}(3e^4 + 1)$$

$$2. I = \frac{5}{4}(3e^4 - 1)$$

$$3. I = \frac{5}{16}(3e^4 - 1)$$

$$4. I = \frac{5}{16}(3e^4 + 1)$$

$$5. I = \frac{15}{16}e^4$$

004 10.0 points

Evaluate the integral

$$I = \int_e^3 \frac{\ln(x)}{x^2} dx.$$

$$1. I = \frac{2}{e} - \frac{1}{3}(\ln(3) - 1)$$

$$2. I = \frac{2}{e} - \frac{1}{3}(\ln(3) + 1)$$

$$3. I = \frac{3}{e} - \frac{1}{2}(\ln(3) + 1)$$

$$4. I = \frac{3}{e} + \frac{1}{2}(\ln(3) + 1)$$

$$5. I = \frac{3}{e} - \frac{1}{2}(\ln(3) - 1)$$

$$6. I = \frac{2}{e} + \frac{1}{3}(\ln(3) + 1)$$

005 10.0 points

Evaluate the integral

$$I = \int_0^1 4xe^{3x} dx.$$

$$1. I = \frac{4}{9}e^3$$

$$2. I = \frac{4}{3}e^3$$

$$3. I = \frac{4}{3}(3e^3 + 1)$$

$$4. I = \frac{4}{9}(3e^3 + 1)$$

$$5. I = \frac{4}{9}(2e^3 + 1)$$

$$6. I = \frac{4}{3}(2e^3 + 1)$$

006 10.0 points

Determine the integral

$$I = \int e^{-4x} \cos 3x dx.$$

$$1. I = \frac{1}{7}e^{-4x}(3 \cos 3x + 4 \sin 3x) + C$$

$$2. I = -\frac{1}{7}e^{-4x}(3 \cos 3x + 4 \sin 3x) + C$$

$$3. I = \frac{1}{25}e^{-4x}(3 \cos 3x - 4 \sin 3x) + C$$

$$4. I = \frac{1}{25}e^{-4x}(3 \sin 3x + 4 \cos 3x) + C$$

$$5. I = \frac{1}{7}e^{-4x}(3 \sin 3x - 4 \cos 3x) + C$$

$$6. I = \frac{1}{25}e^{-4x}(3 \sin 3x - 4 \cos 3x) + C$$

007 10.0 points

Evaluate the integral

$$I = \int_0^{\pi/2} 2x \cos x dx.$$

$$1. I = -2$$

$$2. I = \pi$$

$$3. I = \pi - 2$$

$$4. I = \frac{1}{2}$$

$$5. I = \pi - 1$$

$$6. I = 2\pi$$

008 10.0 points

Evaluate the integral

$$I = \int_0^{\pi/4} (x + 6) \cos 2x dx.$$

$$1. I = \frac{1}{4}\pi + \frac{11}{2}$$

$$2. I = \frac{1}{8}\pi + \frac{11}{4}$$

$$3. I = \frac{1}{8}\pi + \frac{11}{2}$$

$$4. I = \frac{1}{8}\pi - \frac{13}{4}$$

$$5. I = \frac{1}{4}\pi - \frac{13}{2}$$

009 10.0 points

Determine the integral

$$I = \int e^x \sin 2x dx.$$

$$1. I = -\frac{2}{5}e^x(\cos 2x + \frac{1}{2}\sin 2x) + C$$

$$2. I = \frac{2}{5}e^x(\cos 2x - 2\sin 2x) + C$$

$$3. I = -\frac{2}{5}e^x(\cos 2x - \frac{1}{2}\sin 2x) + C$$

$$4. I = -\frac{4}{5}e^{-x}(\cos 2x - \frac{1}{2}\sin 2x) + C$$

$$5. I = \frac{4}{5}e^{-x}(\cos 2x + 2\sin 2x) + C$$

$$6. I = -\frac{4}{5}e^x(\cos 2x + \frac{1}{2}\sin 2x) + C$$

010 10.0 points

Determine the indefinite integral

$$I = \int e^{-x} \sin 2x \, dx .$$

1. $I = \frac{1}{5}e^{-x}(\sin 2x + 2 \cos 2x) + C$

2. $I = -\frac{1}{4}e^x(\sin 2x - 2 \cos 2x) + C$

3. $I = \frac{1}{5}e^x(\sin 2x - 2 \cos 2x) + C$

4. $I = -\frac{1}{4}e^{-x}(\sin 2x - 2 \cos 2x) + C$

5. $I = -\frac{1}{5}e^{-x}(\sin 2x + 2 \cos 2x) + C$

6. $I = \frac{1}{4}e^x(\sin 2x + 2 \cos 2x) + C$

011 10.0 points

Evaluate the integral

$$I = \int_0^1 x f''(x) \, dx .$$

1. $I = f'(1) + f(1) - f(0)$

2. $I = f'(1) - f'(0) - f(1) + f(0)$

3. $I = f'(1) - f'(0) - f(1) - f(0)$

4. $I = f'(1) - f(1) + f(0)$

5. $I = f'(1) + f(1) + f(0)$

012 10.0 points

Evaluate the integral

$$I = \int_0^{\pi/2} \cos^3 x \, dx .$$

1. $I = \frac{1}{3}$

2. $I = \frac{5}{6}$

3. $I = 1$

4. $I = \frac{2}{3}$

5. $I = \frac{1}{6}$

013 10.0 points

Determine the integral

$$I = \int (5 \cos(\theta) + 4 \cos^3(\theta)) \, d\theta .$$

1. $I = 5 \sin(\theta) - \frac{4}{3} \sin^3(\theta) + C$

2. $I = 9 \cos(\theta) + \frac{4}{3} \cos^3(\theta) + C$

3. $I = 9 \cos(\theta) - \frac{4}{3} \cos^3(\theta) + C$

4. $I = 5 \cos(\theta) + \frac{4}{3} \cos^3(\theta) + C$

5. $I = 5 \sin(\theta) + \frac{4}{3} \sin^3(\theta) + C$

6. $I = 9 \sin(\theta) - \frac{4}{3} \sin^3(\theta) + C$

014 10.0 points

Evaluate the integral

$$I = \int_0^{\pi/2} 3 \sin^3(x) \cos^2(x) \, dx .$$

1. $I = \frac{2}{5}$

2. $I = \frac{6}{5}$

3. $I = \frac{4}{5}$

4. $I = \frac{1}{5}$

5. $I = \frac{8}{5}$

015 10.0 points

Determine the indefinite integral

$$I = \int 3 \sin^2 x \cos^3 x \, dx .$$

1. $I = \frac{3}{5} \cos^3 x - \sin^5 x + C$

2. $I = \sin^3 x + \frac{3}{5} \sin^5 x + C$

3. $I = \frac{3}{5} \cos^3 x + \sin^5 x + C$

4. $I = -\frac{3}{5} \sin^3 x - \cos^5 x + C$

5. $I = \sin^3 x - \frac{3}{5} \sin^5 x + C$

6. $I = -\cos^3 x + \frac{3}{5} \cos^5 x + C$

016 10.0 points

To which one of the following does the integral

$$I = \int \frac{x^2}{\sqrt{x^2 - 1}} \, dx$$

reduce after an appropriate trig substitution?

1. $I = \int \tan^3(\theta) \, d\theta$

2. $I = \int \tan^2(\theta) \sec^3(\theta) \, d\theta$

3. $I = \int \sin^3(\theta) \sec^2(\theta) \, d\theta$

4. $I = \int \sin^3(\theta) \, d\theta$

5. $I = \int \sin^2(\theta) \sec^3(\theta) \, d\theta$

6. $I = \int \sec^3(\theta) \, d\theta$

017 10.0 points

To which one of the following does the integral

$$I = \int \frac{x}{\sqrt{x^2 + 1}} \, dx$$

reduce after an appropriate trig substitution?

1. $I = \int \tan(\theta) \sec^2(\theta) \, d\theta$

2. $I = \int \tan^2(\theta) \, d\theta$

3. $I = \int \sin(\theta) \sec^2(\theta) \, d\theta$

4. $I = \int \sin^2(\theta) \sec(\theta) \, d\theta$

5. $I = \int \sec^2(\theta) \, d\theta$

6. $I = \int \sin^2(\theta) \, d\theta$

018 10.0 points

To which of the following does the integral

$$I = \int \frac{x^3}{\sqrt{1 - x^2}} \, dx$$

reduce after an appropriate trig substitution?

1. $I = \int \sin^3(\theta) \, d\theta$

2. $I = \int \tan(\theta) \sec^3(\theta) \, d\theta$

3. $I = \int \sec^3(\theta) \sin^4(\theta) \, d\theta$

4. $I = \int \sin^3(\theta) \sec^3(\theta) \, d\theta$

5. $I = \int \sin^3(\theta) \sec^4(\theta) \, d\theta$

019 10.0 points

Evaluate the integral

$$I = \int_0^1 \frac{4}{\sqrt{2-x^2}} dx.$$

1. $I = \frac{4}{3}$

2. $I = \frac{2}{3}$

3. $I = \frac{2}{3}\pi$

4. $I = \frac{4}{3}\pi$

5. $I = \pi$

6. $I = 1$

020 10.0 points

Evaluate the integral

$$I = \int_0^1 \frac{1}{\sqrt{4-3x^2}} dx.$$

1. $I = \frac{\pi}{3\sqrt{3}}$

2. $I = \frac{2\pi}{3\sqrt{3}}$

3. $I = 2$

4. $I = \frac{1}{2}$

5. $I = \frac{1}{3}$

6. $I = \frac{\frac{1}{2}\pi}{\sqrt{3}}$