

This print-out should have 13 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

**001 10.0 points**

Evaluate the integral

$$I = \int_0^1 x(1-x^2)^4 dx.$$

**1.**  $I = -\frac{1}{4}$

**2.**  $I = \frac{1}{8}$

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

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

**5.**  $I = -\frac{1}{8}$

**6.**  $I = \frac{1}{10}$

**002 10.0 points**

Evaluate the integral

$$I = \int_0^{\pi/2} \sin x \{2f'(\cos x) - 1\} dx$$

when  $f(0) = 2$  and  $f(1) = 4$ .

**1.**  $I = 6$

**2.**  $I = 4$

**3.**  $I = 7$

**4.**  $I = 5$

**5.**  $I = 3$

**003 10.0 points**

Evaluate the integral

$$I = \int_0^{\pi/4} \left( \frac{1}{\cos^2 \theta} + 2 \cos 2\theta \right) d\theta.$$

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

**2.**  $I = 2$

**3.**  $I = 1$

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

**5.**  $I = 0$

**004 10.0 points**

Evaluate the definite integral

$$I = \int_1^2 6 \ln(3x) dx.$$

**1.**  $I = 6(\ln 3 - 1)$

**2.**  $I = 6 \ln 12$

**3.**  $I = 6(\ln 12 - 1)$

**4.**  $I = 6(\ln 6 - 1)$

**5.**  $I = 6 \ln 6$

**6.**  $I = 6 \ln 3$

**005 10.0 points**

Determine the indefinite integral

$$I = \int \cos(\ln(x)) dx.$$

**1.**  $I = \frac{1}{2}x\{\cos(\ln(x)) - \sin(\ln(x))\} + C$

**2.**  $I = x\{\sin(\ln(x)) - \cos(\ln(x))\} + C$

**3.**  $I = \frac{1}{2}x\{\sin(\ln(x)) - \cos(\ln(x))\} + C$

**4.**  $I = \frac{1}{2}x\{\cos(\ln(x)) + \sin(\ln(x))\} + C$

**5.**  $I = x\{\sin(\ln(x)) + \cos(\ln(x))\} + C$

**6.**  $I = x\{\cos(\ln(x)) - \sin(\ln(x))\} + C$

**006 10.0 points**

If  $f$  is a continuous function such that

$$\int_0^{16} f(x) dx = 16,$$

determine the value of the integral

$$I = \int_0^4 6f(4x) dx.$$

**1.**  $I = 21$

**2.**  $I = 22$

**3.**  $I = 23$

**4.**  $I = 24$

**5.**  $I = 25$

**007 10.0 points**

Evaluate the integral

$$I = \int_0^{\pi/4} 6x \sec^2 x dx.$$

**1.**  $I = 3\pi - \frac{3}{2}\ln 2$

**2.**  $I = 3\pi + \frac{3}{2}\ln 2$

**3.**  $I = 3\pi + 6\ln 2$

**4.**  $I = \frac{3}{2}\pi + 3\ln 2$

**5.**  $I = \frac{3}{2}\pi - 6\ln 2$

**6.**  $I = \frac{3}{2}\pi - 3\ln 2$

**008 10.0 points**

Evaluate the integral

$$I = \int_0^1 4 \sin(5\sqrt{x}) dx.$$

**1.**  $I = \frac{4}{5}\left(\frac{1}{5}\sin 5 - \cos 5\right)$

**2.**  $I = \frac{8}{5}\left(\cos 5 - \frac{1}{5}\sin 5\right)$

**3.**  $I = \frac{4}{5}\left(\frac{1}{5}\sin 5 + \cos 5\right)$

**4.**  $I = \frac{8}{5}\left(\frac{1}{5}\sin 5 + \cos 5\right)$

**5.**  $I = \frac{4}{5}\left(\sin 5 + \frac{1}{5}\cos 5\right)$

**6.**  $I = \frac{8}{5}\left(\frac{1}{5}\sin 5 - \cos 5\right)$

**009 10.0 points**

Evaluate the integral

$$I = \int_{\pi/6}^{\pi/3} (9 \sin 2x + 2 \cos 2x) dx.$$

**1.**  $I = \sqrt{3}$

**2.**  $I = 8$

**3.**  $I = 9$

**4.**  $I = \frac{9}{2}$

**5.**  $I = \frac{9}{2}\sqrt{3}$

**6.**  $I = 5\sqrt{3}$

**010 10.0 points**

Determine the integral

$$I = \int t^2 \cos(2 - t^3) dt.$$

- 1.**  $I = -\frac{1}{3} \sin(2 - t^3) + C$
- 2.**  $I = -\sin(2 - t^3) + C$
- 3.**  $I = \cos(2 - t^3) + C$
- 4.**  $I = \frac{1}{3} \sin(2 - t^3) + C$
- 5.**  $I = 3 \cos(2 - t^3) + C$
- 6.**  $I = -3 \cos(2 - t^3) + C$

**011 10.0 points**

Evaluate the integral

$$I = \int_1^2 x^2 f''(x) dx$$

when

$$\begin{aligned} f(1) &= 9, & f(2) &= 7, \\ f'(1) &= 8, & f'(2) &= 6. \end{aligned}$$

- 1.**  $I = 6 + 2 \int_1^2 f(x) dx$
- 2.**  $I = 11 + 2 \int_1^2 f(x) dx$
- 3.**  $I = 6 - 2 \int_1^2 f(x) dx$
- 4.**  $I = 6 - \int_1^2 f(x) dx$
- 5.**  $I = 11 - \int_1^2 f(x) dx$
- 6.**  $I = 11 + \int_1^2 f(x) dx$

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

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

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

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

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

**013 10.0 points**

Determine the integral

$$I = \int (x^2 - 1) \cos(2x) dx.$$

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

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

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

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

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

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