This print-out should have 9 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

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001   10.0 points

$$\sin^2 x = 1 - \cos^2 x$$

Evaluate the integral

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

1. $I = \dfrac{1}{5}$

2. $I = \dfrac{2}{5}$

3. $I = \dfrac{8}{5}$

4. $I = \dfrac{6}{5}$

5. $I = \dfrac{4}{5}$

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002   10.0 points

$$\cos^2 x = 1 - \sin^2(x)$$

Determine the indefinite integral

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

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

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

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

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

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

6. $I = \dfrac{1}{3}\sin^3 x + \dfrac{1}{5}\sin^5 x + C$

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003   10.0 points

Evaluate the indefinite integral

$$I = \int 8 \cos^4 2t \, dt \, .$$

1. $I = 3t - \cos 4t + \dfrac{1}{8}\cos 8t + C$

2. $I = 3t + \cos 4t + \dfrac{1}{8}\cos 8t + C$

3. $I = 3t + \sin 4t - \dfrac{1}{8}\sin 8t + C$

4. $I = 3t + \sin 4t + \dfrac{1}{8}\sin 8t + C$

5. $I = 3t - \sin 4t + \dfrac{1}{8}\sin 8t + C$

6. $I = 3t + \cos 4t - \dfrac{1}{8}\cos 8t + C$

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004   10.0 points

Determine the integral

$$I = \int \left(3\sin(\theta) - 2\sin^3(\theta)\right) d\theta \, .$$

1. $I = \cos(\theta) - \dfrac{2}{3}\cos^3(\theta) + C$

2. $I = \cos(\theta) + \dfrac{2}{3}\sin^3(\theta) + C$

3. $I = -\cos(\theta) - \dfrac{2}{3}\cos^3(\theta) + C$

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

5. $I = \cos(\theta) - \dfrac{2}{3}\sin^3(\theta) + C$

6. $I = -\cos(\theta) + \dfrac{2}{3}\sin^3(\theta) + C$

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005   10.0 points

Evaluate the integral

$$I = \int_0^{\pi/2} \left(4\cos^2(x) + \sin^2(x)\right) dx$$

1. $I = \dfrac{5}{4}\pi$ ⟵(circled)

2. $I = 5$ (crossed out)

3. $I = 5\pi$ (crossed out)

4. $I = \dfrac{5}{2}$ (crossed out)

5. $I = \dfrac{5}{4}$ (crossed out)

6. $I = \dfrac{5}{2}\pi$ (crossed out)

006　10.0 points

Find the value of the integral

$$I = \int_0^{\frac{\pi}{4}} \sec^2 x (3 - 2\tan x)\, dx\,.$$

Enter your answer as a decimal with four significant digits.

007　10.0 points

Find the value of the definite integral

$$I = \int_0^{\pi/4} \Big(8\sec^4(x) - 5\sec^2(x)\Big)\tan(x)\, dx\,.$$

1. $I = \dfrac{7}{2}$ ⟵(circled)

2. $I = \dfrac{11}{2}$ (crossed out)

3. $I = 5$ (crossed out)

4. $I = 4$ (crossed out)

5. $I = \dfrac{9}{2}$ (crossed out)

008　10.0 points

Evaluate the integral

$$I = \int_0^{\pi/3} \frac{\sec(x)\tan(x)}{5 + 2\sec(x)}\, dx\,.$$

1. $I = -2\ln\left(\dfrac{7}{5}\right)$ (crossed out)

2. $I = \dfrac{1}{2}\ln\left(\dfrac{7}{5}\right)$ (crossed out)

3. $I = -2\ln\left(\dfrac{9}{10}\right)$ (crossed out)

4. $I = \dfrac{1}{2}\ln\left(\dfrac{9}{7}\right)$ ⟵(circled)

5. $I = -\dfrac{1}{2}\ln\left(\dfrac{9}{7}\right)$ (crossed out)

6. $I = 2\ln\left(\dfrac{9}{10}\right)$ (crossed out)

009　10.0 points

Find the value of

$$I = \int_0^{\pi/4} 4\tan^4 x\, dx\,.$$

1. $I = \dfrac{1}{3}(3\pi - 8)$ ⟵(circled)

2. $I = \dfrac{1}{3}(3\pi - 4)$ (crossed out)

3. $I = \dfrac{1}{2}(3\pi - 2)$ (crossed out)

4. $I = \dfrac{1}{2}(3\pi - 8)$ (crossed out)

5. $I = \dfrac{1}{2}(3\pi - 4)$ (crossed out)

6. $I = \dfrac{1}{3}(3\pi - 2)$ (crossed out)