

This print-out should have 5 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

001 10.0 points

Which of the following integrals are improper?

$$I_1 = \int_0^1 \frac{1}{\sqrt{x}} dx,$$

$$I_2 = \int_0^2 \frac{x+2}{x+1} dx,$$

$$I_3 = \int_1^\infty \frac{1}{1+x^2} dx.$$

1. I_3 only
2. none of them
3. I_2 and I_3 only
4. I_2 only
5. I_1 and I_3 only
6. I_1 and I_2 only
7. I_1 only
8. all of them

002 10.0 points

Determine if the integral

$$I = \int_0^\infty e^{-9x} dx$$

is convergent, and if it is, find its value.

1. $I = -\frac{1}{9}$

2. $= 9$

3. $I = \frac{1}{9}$

4. $I = -9$

5. integral is divergent

003 10.0 points

Determine if the improper integral

$$I = \int_4^\infty e^{-x/2} dx$$

converges, and if it does, compute its value.

1. $I = e^{-2}$
2. $I = 2e^2$
3. I does not converge
4. $I = 2e^{-2}$
5. $I = -2e^{-2}$

004 10.0 points

Determine if the improper integral

$$I = \int_4^\infty 2xe^{-4x^2} dx$$

converges, and if it does, find its value.

1. $I = \frac{1}{4}e^{-64}$
2. $I = \frac{1}{4}e^{64}$
3. I does not converge
4. $I = 2e^{-64}$

5. $I = \frac{1}{2}e^{64}$

6. $I = \frac{1}{2}e^{-64}$

005 10.0 points

Determine if the improper integral

$$I = \int_1^{\infty} \frac{6x}{(1+x^2)^2} dx$$

converges, and if it does, compute its value.

1. $I = 6$

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

3. $I = 3$

4. $I = 2$

5. integral doesn't converge