

1. $\lim_{x \rightarrow 0} \frac{e^x - x - 1}{x^2}$

A. $-\infty$ B. $-\frac{1}{2}$ C. $\frac{1}{2}$

D. 1

E. ∞

2. Evaluate $\lim_{x \rightarrow \frac{\pi}{2}^+} \frac{\ln\left(x - \frac{\pi}{2}\right)}{\tan x}$

Evaluate the integral

3. $\int_3^{\infty} \frac{1}{(x-2)^{\frac{3}{2}}} dx$

4. $\int_0^{\infty} \frac{1}{\sqrt[4]{1+x}} dx$

5. $\int_{-\infty}^0 \frac{1}{3-4x} dx$

6. $\int_2^{\infty} e^{-5p} dp$

$$7. \int_{-\infty}^0 2^r dr$$

$$8. \int_0^{\infty} \frac{x^2}{\sqrt{1+x^3}} dx$$

$$9. \int_{-\infty}^{\infty} (y^3 - 3y^2) dy$$

$$10. \int_{-\infty}^{\infty} x e^{-x^2} dx$$

$$11. \int_1^{\infty} \frac{e^{-\sqrt{x}}}{\sqrt{x}} dx$$

$$12. \int_0^{\infty} \sin^2 \alpha d\alpha$$

$$13. \int_{-\infty}^0 z e^{2z} dz$$

$$14. \int_{-\infty}^{\infty} \frac{x^2}{9+x^6} dx$$

Answers:

1. C

2. 0

3. 2 \therefore Converges

4. Diverges

5. Diverges

6. $\frac{1}{5e^{10}}$ \therefore Converges

7. $\frac{1}{\ln 2}$ \therefore Converges

8. Diverges

9. Diverges

10. 0 \therefore Converges

11. $\frac{2}{e}$ \therefore Converges

12. Diverges

13. $-\frac{1}{4}$ \therefore Converges

14. $\frac{\pi}{9}$ \therefore Converges