Class Participation Indeterminate Forms & Improper Integrals

14-16 Februari 2023

Semua mahasiswa akan mengerjakan dua soal (satu soal indeterminate form dan satu soal improper integral). Satu soal dapat dikerjakan oleh **maksimal** empat mahasiswa (menjawab soal yang telah dijawab oleh empat mahasiswa tidak akan direkap).
Unggah jawaban Anda di forum pada laman SCELE paling lambat hari Kamis, 16 Februari 2023 pukul 20.00 WIB.

Soal Indeterminate Forms

Carilah nilai limit dari:

1. $\lim_{x \to \infty} \frac{4x}{ln\left(50x + e^{x}\right)}$
2. $\lim_{x \to 0^{+}} \frac{sin\,(x) - 4x}{2x^{2}}$
3. $\lim_{x \to 1} \left(2x - e^{\frac{x-1}{5}}\right)^{\frac{5}{x-1}}$
4. $\lim_{x \to 0} \left(x^{2}\right)^{3x}$
5. $\lim_{x \to 0^{-}} \frac{sin\,(x) + tan\,(x)}{4 - 2e^{-x} - 2e^{x}}$
6. $\lim_{x \to 0} \frac{9x^{2}}{ln\,(cos\,(3x))}$
7. $\lim_{x \to 0} \frac{e^{x} - 1 - x}{x^{2}}$
8. $\lim_{x \to 0} \frac{x3^{x}}{3^{x} - 1}$
9. $\lim_{x \to 1} \frac{x^{2} - 1}{x^{2} - x}$
10. $\lim_{\theta \to \frac{\pi}{2}} \frac{1 - sin\,(\Theta)}{1 + cos\,(2\Theta)}$
11. $\lim_{x \to \infty} \frac{ln\,(x)}{\sqrt{x}}$
12. $\lim_{x \to \infty} x^{3} e^{-x^{2}}$
13. $\lim_{x \to 1^{+}} ln\,(x)\,tan\left(\frac{\pi x}{2}\right)$
14. $\lim_{x \to 0} \frac{\sqrt{1 + 2x} - \sqrt{1 - 4x}}{x}$
15. $\lim_{x \to 0} \frac{cos\,(x) - 1 + \frac{1}{2}x^{2}}{x^{4}}$
16. $\lim_{x \to 0^{+}} \left(\frac{1}{x} - \frac{1}{e^{x} - 1}\right)$
17. $\lim_{x \to \infty} (x - ln\,(x))$
18. $\lim_{x \to 0^{+}} x^{\sqrt{x}}$
19. $\lim_{x \to 0} (1 - 2x)^{\frac{1}{x}}$
20. $\lim_{x \to \infty} x^{\frac{1}{x}}$

Soal Improper Integral

Tentukanlah apakah integral dibawah converge atau diverge. Jika converge, hitung nilai integralnya.

1. $\int_{1}^{\infty} \frac{2x}{\left(x^{2} + 2\right)^{2}} dx$
2. $\int_{-\infty}^{\infty} x\left(x^{2} + 4\right)^{-1} dx$

3. $\int_{-\infty}^{\infty} sech\,(x)\,dx$

4. $\int_{4}^{\infty} (\pi - x)^{-\frac{2}{3}}\,dx$

5. $\int_{-1}^{4} x^{-4}dx$

6. $\int_{\sqrt{5}}^{\sqrt{8}} \frac{2}{\left(16-4x^2\right)^{\frac{1}{3}}}\,dx$

7. $\int_{100}^{\infty} \frac{2x}{\sqrt{x^2+4}}\,dx$

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

9. $\int_{2}^{\infty} e^{-5p}\,dp$

10. $\int_{0}^{\infty} \frac{x^2}{\sqrt{1+x^3}}\,dx$

11. $\int_{-\infty}^{\infty} xe^{-x^2}\,dx$

12. $\int_{0}^{\infty} sin^2(a)\,da$

13. $\int_{1}^{\infty} \frac{1}{x^2+x}\,dx$

14. $\int_{-\infty}^{0} ze^{2z}\,dz$

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

16. $\int_{e}^{\infty} \frac{1}{x\,(ln\,(x))^3}\,dx$

17. $\int_{0}^{9} \frac{1}{\sqrt[3]{x-1}}\,dx$

18. $\int_{0}^{3} \frac{1}{x^2-6x+5}\,dx$

19. $\int_{-1}^{0} \frac{e^{\frac{1}{x}}}{x^3}\,dx$

20. $\int_{0}^{2} z^2\,ln(z)\,dz$