

East Los Angeles College
Department of Mathematics
Math 262
Practice Test 1

Perform the following limits.

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

2. $\lim_{x \rightarrow \infty} \ln\left(\frac{1}{x^3}\right)$

3. $\lim_{x \rightarrow \infty} \log\left(\frac{x^2 - 4x + 3}{x^2 + 10x + 1}\right)$

4. $\lim_{x \rightarrow 0^+} 10^{-\frac{1}{x}}$

5. $\lim_{x \rightarrow -\infty} \tan^{-1}(e^{-x})$

6. $\lim_{x \rightarrow -1} \sin^{-1}\left(\frac{2x}{x-1}\right)$

7. Use logarithmic differentiation to differentiate the following.

$$f(x) = \frac{x^2 \sqrt{2x+5}}{(3x-2)^4}$$

8. Determine intervals of increasing/decreasing.

$$y = (x-2)e^{-x}$$

9. Determine the intervals of concavity and any inflection points.

$$y = \frac{\ln(x)}{\sqrt{x}}$$

Differentiate the following

10. $f(x) = xe^{-\pi x}$

11. $f(x) = \ln[\sec(x) + \tan(x)]$

12. $f(x) = x - \tan^{-1}(x^2)$

13. $f(x) = x^{\cos(x)}$

14. $f(x) = \sin^{-1}(\sqrt{x})$

15. $f(x) = e^{\sqrt{x} + x \tan(x)}$

Integrate the following

16. $\int \cot(x) dx$

17. $\int \frac{1}{e^{2\pi x}} dx$

18. $\int \frac{1}{4x-3} dx$

19. $\int \frac{x^2 + x - 3}{x} dx$

20. $\int \frac{1}{9+x^2} dx$

21. $\int \frac{1}{1+4x^2} dx$

22. $\int \frac{1}{\sqrt{16-x^2}} dx$

23. $\int \frac{1}{\sqrt{1-25x^2}} dx$

$$24. \int_0^{\sqrt{3}/4} \frac{1}{1+16x^2} dx$$

$$25. \int_0^{1/2} \frac{\sin^{-1} x}{\sqrt{1-x^2}} dx$$

$$26. \int \frac{1+x}{1+x^2} dx$$

$$27. \int \frac{1}{x\sqrt{9x^2-25}} dx$$

$$28. \int \left(2 + \frac{1}{x}\right) \left(5 - \frac{1}{x}\right) dx$$

$$29. \int x e^{4x^2} dx$$