

Q1) Choose the correct answer

1. If $f(x) = \ln(3x^2 + 1)$ then $f'(x)$ is:
 a. $\frac{6x}{3x^2+1}$
 b. $\frac{3x}{3x^2+1}$
 c. $\frac{6}{3x^2+1}$
 d. $\ln(6x)$
2. If $f(x) = x \ln x$, then $f'(x)$ is:
 a. $\ln x$
 b. $1 + \ln x$
 c. x
 d. $\frac{1}{x}$
3. If $f(x) = \ln\left(\frac{x^2+1}{x}\right)$, then $f'(x)$ is:
 a. $\frac{2x}{x^2+1} - \frac{1}{x}$
 b. $\frac{2x}{x^2+1} + \frac{1}{x}$
 c. $\frac{1}{x^2+1}$
 d. $\frac{2}{x}$
4. $\frac{d}{dx}(\sin^{-1} x)$
 a. $\frac{1}{1+x^2}$
 b. $\frac{1}{\sqrt{1-x^2}}$
 c. $\sqrt{1-x^2}$
 d. $-\frac{1}{\sqrt{1-x^2}}$
5. If $f(x) = \tan^{-1}(3x)$, then $f'(x)$ is:
 a. $\frac{3}{1+9x^2}$
 b. $\frac{1}{1+3x^2}$
 c. $\frac{3}{1+x^2}$
 d. $\frac{1}{1+9x^2}$
6. $\frac{d}{dx}(\cos^{-1} x)$
 a. $\frac{1}{\sqrt{1-x^2}}$
 b. $-\frac{1}{\sqrt{1-x^2}}$
 c. $\frac{-x}{\sqrt{1-x^2}}$
 d. $\frac{1}{1-x^2}$
7. If $xy + y^2 = 10$, then $\frac{dy}{dx}$ is:
 a. $\frac{-y}{x+2y}$
 b. $\frac{y}{x+2y}$
 c. $\frac{-x}{y+2x}$
 d. $\frac{x}{y+2x}$
8. If $f'(x) = 0$ and $f''(x) > 0$, then f has:
 a. Maximum
 b. Minimum
 c. Inflection point
 d. No conclusion
9. $\int 3x^2 dx =$
 a. $x^3 + C$
 b. $3x^3 + C$
 c. $x^2 + C$
 d. $6x + C$
10. $\int \frac{1}{x} dx =$
 a. $\ln x + C$
 b. $\frac{1}{x^2} + C$
 c. $x \ln x + C$
 d. $e^x + C$
11. $\int e^{2x} dx =$
 a. $e^{2x} + C$
 b. $\frac{1}{2}e^{2x} + C$
 c. $2e^{2x} + C$
 d. $e^x + C$
12. $\int (2x + 3) dx =$
 a. $x^2 + 3x + C$
 b. $2x^2 + 3x + C$
 c. $x^2 + \frac{3}{2}x + C$
 d. $2x + 3 + C$
13. $\int \frac{1}{x^3} dx =$
 a. $-\frac{1}{2x^2} + C$
 b. $\frac{1}{2x^2} + C$
 c. $\ln x + C$
 d. $-\frac{1}{x^2} + C$
14. $\int \sqrt{x} dx =$
 a. $\frac{2}{3}x^{3/2} + C$
 b. $\frac{1}{2}x^{3/2} + C$
 c. $x^{3/2} + C$
 d. $\frac{3}{2}x^{1/2} + C$
15. $\int e^{3x} dx =$
 a. $e^{3x} + C$
 b. $\frac{1}{3}e^{3x} + C$
 c. $3e^{3x} + C$
 d. $e^x + C$
16. $\int \cos x dx =$
 a. $\sin x + C$
 b. $-\sin x + C$
 c. $\cos x + C$
 d. $-\cos x + C$
17. $\int \frac{1}{1+x^2} dx =$
 a. $\tan^{-1} x + C$
 b. $\sin^{-1} x + C$
 c. $\ln(1+x^2) + C$
 d. $\frac{1}{x^2} + C$
18. $\int (4x^3 - 2x) dx =$
 a. $x^4 - x^2 + C$
 b. $4x^4 - 2x^2 + C$
 c. $x^4 - 2x^2 + C$
 d. $x^4 - x + C$
19. $\int \frac{2}{\sqrt{1-x^2}} dx =$
 a. $2 \sin^{-1} x + C$
 b. $\cos^{-1} x + C$
 c. $\tan^{-1} x + C$
 d. $\frac{2}{1-x^2} + C$