

1. Find the 14<sup>th</sup> derivative of  $f(x) = \cos 3x$ .

2. Find  $\frac{dy}{dx}$  if  $y = \text{Arc sec}(2x)$ .

3. If  $s(t) = \frac{x}{\sin x}$ ,  $v(t) =$

4. Find the slope of the line tangent to  $f(x) = x \cos x$  at  $x = \pi$

5.  $\int \frac{\sin x}{\cos^3 x} dx =$

6.  $\int \sin(3 - 4x) dx =$

7. If  $f(x) = \sec x - \tan x$ , find  $f'\left(\frac{\pi}{4}\right)$

8. Evaluate  $\lim_{h \rightarrow 0} \frac{\cot\left(\frac{\pi}{6} + h\right) - \cot \frac{\pi}{6}}{h}$ .

9.  $\int_{\frac{\pi}{6}}^{\frac{5\pi}{6}} \cos x dx - \int_{\frac{\pi}{3}}^{2\pi} \sin x dx =$

10. If  $\sec\left(2x - \frac{\pi}{4}\right)$ ,  $\frac{dy}{dx}\Big|_{x=\frac{3\pi}{4}} =$

11. Find  $f'(x)$  if  $f(x) = \sec^3 x \cos^2 x$

12. Evaluate  $\int \sin^4(5x) \cos(5x) dx$

13.  $\int \frac{\sec^2 x}{\sqrt{2 - \tan x}} dx =$

14.  $f'(2)$  if  $f(x) = \cot^{-1}(x^3)$

15. Evaluate  $\int \tan^2 x \sec^2 x dx$

16. Find  $f'\left(\frac{\sqrt{\pi}}{2}\right)$  if  $y = \tan(x^2)$

17.  $\int \frac{\cot x}{\csc^2 x} dx$

18. Find  $g'(x)$  if  $g(x) = \cos 3x \sin 2x$

19. Find the position function  $s(t)$  of a body if  $a(t) = 8 \cos 2t$ ,  $v(0) = 1$ , and  $s(0) = 2$ .

20. Find the equation of the line tangent to  $f(x) = \sin 2x \cos 2x$  at  $\left(\frac{\pi}{3}, \frac{-\sqrt{3}}{4}\right)$