

Chapter 9

Derivatives Drill 2



DERIVATIVES DRILL 2

- If $f(x) = \sin(\csc x)$, then $f'(x) =$
 - $\csc x \cot x \cos(\csc x)$
 - $-\csc x \cot x \cos(\csc x)$
 - $\cot^2 x \cos(\csc x)$
 - $-\cot^2 x \cos(\csc x)$
 - $\cos(-\csc x \cot x)$
- If $y = 6x^5 - 5x^4$, then $y^{(4)} =$
 - $30x^4 - 20x^3$
 - $120x^3 - 60x^2$
 - $360x^2 - 120x$
 - $720x - 120$
 - 720
- Find the derivative of $f(x) = e^{2x} \sin^2 3x$.
 - $2e^{2x} \sin 3x (\sin 3x + 3\cos 3x)$
 - $6e^{2x} \sin^2 3x + 2e^{2x} \sin 3x \cos 3x$
 - $2e^{2x} \sin 3x (\sin 3x - 3\cos 3x)$
 - $-2e^{2x} \sin 3x (\sin 3x + 3\cos 3x)$
 - $2e^{2x} \sin 3x \cos x - 6e^{2x} \sin^2 3x$
- If $y = e^x (\ln x)^2$, then $y' =$
 - $2e^x \ln x$
 - $\left(\frac{2}{x}\right)e^x \ln x$
 - $e^x \ln x \left[\ln x + \frac{1}{x}\right]$
 - $2xe^x \ln x$
 - $\frac{2 \ln x}{xe^x}$
- If $y = \tan^2(3\theta)$, then $y' =$
 - $\sec^2(3\theta) - 1$
 - $2 \tan(3\theta)$
 - $6 \sec^2(3\theta)$
 - $6 \tan(3\theta) \sec^2(3\theta)$
 - $3 \tan(3\theta) \sec^2(3\theta)$
- If $f(x) = \sin(\sin(\sin x))$, then what is $f'(x)$?
 - $\cos(\cos(\cos x))$
 - $\cos x \cos(\sin x) \cos(\sin(\sin x))$
 - $\cos(\sin(\cos x))$
 - $\cos x + \sin x \cos x + \sin^2 x$
 - $\cos(\cos x) \cos x$
- If $y = \cos^4(\sin^3 x)$, then $y' =$
 - $-12 \sin^2 x \cos x \sin(\sin^3 x) \cos^3(\sin^3 x)$
 - $4 \cos^3(\sin^3 x)$
 - $4 \cos^3(3 \sin^2 x)$
 - $\cos^4(3 \sin^2 x)$
 - $12 \sin^2 x \cos x \sin(\sin^3 x) \cos^3(\sin^3 x)$
- What is the derivative of $f(x) = \sin^2 \pi x$?
 - $2\pi \sin 2\pi x$
 - $2 \cos \pi x$
 - $\sin 2\pi x$
 - $\pi \sin 2\pi x$
 - $\sin \pi x \cos \pi x$
- If $y = \cos(\tan x)$, then $y' =$
 - $\sec^2 x \sin(\tan x)$
 - $-\sin(\sec^2 x)$
 - $-\sec^2 x \sin(\tan x)$
 - $\sec x \tan x \sin(\tan x)$
 - $-\sec x \tan x \sin(\tan x)$

10. If $f(x) = (x^2 + x^{-3})(x^5 - 2x^2)$, then $f'(x) =$

- (A) $-3x^2 + 2x + 2x^{-2}$
- (B) $3x^2 + 2x - 2x^{-2}$
- (C) $x^3 + x^2 - 2 - 2x^{-1}$
- (D) $x^4 + x^3 - 2x + 2 \ln x$
- (E) $-3x^2 - 2x - 2x^2$

11. What is the derivative of $y = \frac{2t}{(4+t^2)}$?

- (A) $\frac{(8+2t^2)}{(4+t^2)^2}$
- (B) $\frac{(8-2t^2)}{(4+t^2)^2}$
- (C) $\frac{1}{2t^2}$
- (D) $\frac{-(8-2t^2)}{(4+t^2)^2}$
- (E) $\frac{-(8+2t^2)}{(4+t^2)^2}$

12. Find the derivative of $y = \frac{(x+1)}{(x^3+x-2)}$

- (A) $\frac{(2x^3+3x^2+1)}{(x^3+x-2)^2}$
- (B) $\frac{(2x^3-3x^2-1)}{(x^3+x-2)^2}$
- (C) $\frac{1}{(3x^2+1)}$
- (D) $\frac{-(2x^3-3x^2-1)}{(x^3+x-2)^2}$
- (E) $\frac{-(2x^3+3x^2+1)}{(x^3+x-2)^2}$

13. If $y = \sqrt{x} \sin x$, then $y' =$

- (A) $\frac{1}{2}x^{-\frac{1}{2}}[\sin x + 2x \cos x]$
- (B) $\frac{1}{2}\sqrt{x}[\sin x + 2x \cos x]$
- (C) $\frac{1}{2}x^{-\frac{1}{2}} \cos x$
- (D) $\sqrt{x} \cos x$
- (E) $-\frac{1}{2}x^{-\frac{1}{2}}[\sin x + 2x \cos x]$

14. If $f(x) = x^2 \sin x \tan x$, then $f'(x) =$

- (A) $2x \cos x \sec^2 x$
- (B) $x^2 (\cos x \tan x + \sin x \sec^2 x) + 2x (\sin x \tan x)$
- (C) $-x^2 (\cos x \tan x + \sin x \sec^2 x) + 2x (\sin x \tan x)$
- (D) $-2x \cos x \sec^2 x$
- (E) $x^2 (\cos x + \sec^2 x)$

15. What is the derivative of $y = \tan(\sin x)$?

- (A) $\sec^2(\cos x)$
- (B) $\cos x \sec(\sin x) \tan(\sin x)$
- (C) $\cos x \sec^2(\sin x)$
- (D) $-\cos x \sec^2(\sin x)$
- (E) $-\sec^2(\cos x)$

16. If $y = 2 \csc(4x)$, then $y' =$

- (A) $-2 \cot^2(4x)$
- (B) $2 \cot^2(4x)$
- (C) $-8 \csc(x) \cot(x)$
- (D) $2\theta \csc(4x) \cot(4x)$
- (E) $-8 \csc(4x) \cot(4x)$

17. What is the derivative of $y = (x^2 + 2x)e^x$?

- (A) $(x + 1)e^x$
- (B) $2(x + 1)e^x$
- (C) $2x(x + 1)e^{x-1}$
- (D) $(x^2 + 4x + 2)e^x$
- (E) $(x^2 - 4x - 2)e^x$

18. If $y = e^2 \ln x$, then $y' =$

- (A) 0
- (B) $\frac{e^2}{x}$
- (C) $\frac{2e}{x}$
- (D) $2e \ln x + \frac{e^2}{x}$
- (E) $2e \ln x - \frac{e^2}{x}$

19. Find $f'(x)$ if $f(x) = \tan x + \sec^2 x$.

- (A) $\sec^2 x (1 + 2 \tan x)$
- (B) $2 \sec^2 x + \tan x$
- (C) $\sec^2 x (1 - 2 \tan x)$
- (D) $\tan x - \sec^2 x$
- (E) $2 \sec^2 x - \tan x$

20. If $y = e^{\sin x}$, then $y'(\pi) =$

- (A) -2
- (B) -1
- (C) 0
- (D) 1
- (E) 2

21. Find y' if $y = \ln(4x^2 - 3x + 3)$

- (A) $\frac{(8x + 3)}{(4x^2 - 3x + 3)}$
- (B) $\frac{(8x + 3)}{(4x^2 + 3x + 3)}$
- (C) $\frac{(8x - 3)}{(4x^2 - 3x + 3)}$
- (D) $\frac{-(8x - 3)}{(4x^2 - 3x + 3)}$
- (E) $\frac{-(8x + 3)}{(4x^2 + 3x + 3)}$

22. What is the derivative of $f(x) = x^4 \tan 5x$?

- (A) $\frac{1}{5} x^5 \sec^2 5x$
- (B) $20 x^3 \sec^2 5x$
- (C) $x^3 (4 \tan 5x - 5x \sec^2 5x)$
- (D) $-x^3 (4 \tan 5x - 5x \sec^2 5x)$
- (E) $x^3 (4 \tan 5x + 5x \sec^2 5x)$

23. If $y = \tan^2(\sin \theta)$, then $y' =$

- (A) $-2 \cos \theta \tan(\sin \theta) \sec^2(\sin \theta)$
- (B) $2 \sec^2(\cos \theta)$
- (C) $2 \tan(-\cos \theta)$
- (D) $\cos \theta \tan(\sin \theta) \sec^2(\sin \theta)$
- (E) $2 \cos \theta \tan(\sin \theta) \sec^2(\sin \theta)$

24. If $y = \sec(1 + x^2)$, then $y' =$

- (A) $\sec(2x) \tan(2x)$
- (B) $2x \sec(2x) \tan(2x)$
- (C) $2x \sec^2(1 + x^2)$
- (D) $2x \sec(1 + x^2) \tan(1 + x^2)$
- (E) $2x \tan^2(1 + x^2) \sec(1 + x^2)$

25. If $y \sin(x^2) = x \sin(y^2)$, then $y' =$

- (A) $2 \sec(y^2) - 2 \csc(x^2)$
- (B) $\frac{\sin(y^2) - 2xy \cos(x^2)}{\sin(x^2) - 2xy \cos(y^2)}$
- (C) $2 \cos y - 2 \cos x$
- (D) $\frac{\sin(y^2) + 2xy \cos(x^2)}{\sin(x^2) - 2xy \cos(y^2)}$
- (E) $\frac{\sin(x^2) + 2xy \cos(y^2)}{\sin(y^2) - 2xy \cos(x^2)}$

27. If $\sec y = \sec^2 x$, then $y' =$

- (A) $\frac{2 \sec^2 x \tan x}{\sec y \tan y}$
- (B) $\frac{\sec y \tan y}{2 \sec^2 x \tan x}$
- (C) $2 \sec^2 x \tan x$
- (D) $\tan y - 2 \tan x$
- (E) $\sec y \tan y$

26. If $x^2 \cos y + \sin 2y = xy$, then find y' .

- (A) $\frac{2x \cos y - y}{x + x^2 \sin y - 2 \cos 2y}$
- (B) $x + x^2 \sin y - 2 \cos 2y$
- (C) $2x \cos y - y$
- (D) $\frac{x + x^2 \sin y - 2 \cos 2y}{2x \cos y - y}$
- (E) $\frac{2x \cos y + y}{x + x^2 \sin y - 2 \cos 2y}$