

AP Calc AB
AP Review #1

Name:

Find the derivative of y with respect to x .

1. $y = \cos(5x)$

$$y' = -5 \sin 5x$$

2. $y = e^{0.4x}$

$$y' = 0.4 e^{0.4x}$$

3. $y = \ln(5x-7)$

$$y' = \frac{5}{5x-7}$$

4. $y = \ln(8-2x)$

$$y' = \frac{-2}{8-2x}$$

5. $y = \tan\left(\frac{1}{2}x\right)$

$$y' = \frac{1}{2} \sec^2\left(\frac{1}{2}x\right)$$

6. $y = \sin^{-1}(-4x)$

$$y' = \frac{-4}{\sqrt{1-16x^2}}$$

7. $y = (8x+3)^5$

$$y' = 5(8x+3)^4 \cdot 8$$

8. $y = \sqrt{4-5x}$

$$y' = \frac{1}{2}(4-5x)^{-1/2} \cdot -5$$

9. $y = (3-5x)^{-1/5}$

$$y' = -\frac{1}{5}(3-5x)^{-6/5} \cdot -5$$

10. $y = \sin\left(-\frac{\pi}{3}x\right)$

$$y' = -\frac{\pi}{3} \cos\left(-\frac{\pi}{3}x\right)$$

11. $y = e^{-x}$

$$y' = -e^{-x}$$

12. $y = e^{3x^2+5}$

$$y' = 6x e^{3x^2+5}$$

13. $y = f(g(x))$

$$y' = f'(g(x)) \cdot g'(x)$$

14. $y = [h(x)]^3$

$$y' = 3[h(x)]^2 \cdot h'(x)$$

15. $y = g(2x) - \frac{3}{4}x^3$

$$y' = g'(2x) \cdot 2 - \frac{9}{4}x^2$$

16. $y = \frac{5x+3}{\sin 6x}$

$$y' = \frac{\sin 6x \cdot 5 - (5x+3) \cdot \cos 6x \cdot 6}{[\sin 6x]^2}$$

17. $y = (4x+7)e^{2x}$

$$y' = (4x+7) \cdot 2e^{2x} + e^{2x} \cdot 4$$

18. $y = \csc(8-5x)$

$$y' = -\csc(8-5x) \cot(8-5x) \cdot -5$$

19. $y = \int_{-2}^x 4t+3 \, dt$

$$y' = 4x+3$$

20. $y = \int_{87}^{3x} f(t) \, dt$

$$y' = f(3x) \cdot 3$$

21. $y = \int_{\frac{x}{2}}^{\frac{x}{2}} f(t) \, dt$

$$y' = f\left(\frac{x}{2}\right) \cdot -\frac{1}{2}$$

Evaluate the indefinite integral.

$$22. \int \cos 5x \, dx$$

$$\frac{1}{5} \sin 5x + C$$

$$23. \int e^{-x} \, dx$$

$$-e^{-x} + C$$

$$24. \int 5x + 8 \, dx$$

$$\frac{5x^2}{2} + 8x + C$$

$$25. \int \sin\left(\frac{\pi}{4}x\right) \, dx$$

$$-\frac{4}{\pi} \cos\left(\frac{\pi}{4}x\right) + C$$

$$26. \int e^{\frac{x}{2}} \, dx$$

$$2e^{x/2} + C$$

$$27. \int \frac{2}{7+2x} \, dx$$

$$\ln|7+2x| + C$$

$$28. \int \frac{1}{8-15x} \, dx$$

$$-\frac{1}{15} \ln|8-15x| + C$$

$$29. \int \frac{1}{1+x^2} \, dx$$

$$\tan^{-1}x + C$$

$$30. \int \sec\left(\frac{\pi}{6}x\right) \tan\left(\frac{\pi}{6}x\right) \, dx$$

$$\frac{6}{\pi} \sec\left(\frac{\pi}{6}x\right)$$

$$31. \int \csc^2\left(\frac{1}{10}x\right) \, dx$$

$$-10 \cot\left(\frac{1}{10}x\right) + C$$

$$32. \int (x-7)^3 \, dx$$

$$\frac{(x-7)^4}{4} + C$$

$$33. \int \frac{dx}{(x-7)^{\frac{4}{5}}}$$

$$5(x-7)^{1/5} + C$$

$$34. \int f'(g(x))g'(x) \, dx$$

$$f(g(x)) + C$$

$$35. \int f'(2x) \, dx$$

$$\frac{1}{2}f(2x) + C$$

$$36. \int g'(0.3x+7) \, dx$$

$$\frac{1}{0.3} g(0.3x+7) + C$$

$$37. \int 17 \, dx$$

$$17x + C$$

$$38. \int \frac{9}{19-4x} \, dx$$

$$-\frac{9}{4} \ln|19-4x| + C$$

$$39. \int e^{0.8x} \, dx$$

$$\frac{1}{0.8} e^{0.8x} + C$$