

Unit 7 skill practice

Find the derivative of each.

$$1) y = \log_3 3x^2$$

$$\frac{dy}{dx} = \frac{2}{x \ln 3}$$

$$5) y = \log_2 4x^2$$

$$\frac{dy}{dx} = \frac{2}{x \ln 2}$$

$$2) y = \log_3 (3x^5 + 5)^5$$

$$\frac{dy}{dx} = \frac{75x^4}{(\ln 3)(3x^5 + 5)}$$

$$6) y = \log_5 (-5x^3 - 2)^3$$

$$\frac{dy}{dx} = \frac{-45x^2}{(\ln 5)(-5x^3 - 2)}$$

$$3) y = (4x^3 + 2)^3$$

$$\frac{dy}{dx} = 9x^2 (4x^3 + 2)^2 \cdot 4x^3 \ln 4$$

$$7) y = 3^{(x^4 + 1)^2}$$

$$\frac{dy}{dx} = 12x^3 \cdot 3^{(x^4 + 1)^2} \cdot (x^4 + 1)^2 \cdot (\ln 3)$$

$$4) y = 3^{\cos 3x^4}$$

$$\frac{dy}{dx} = -12x^3 \cdot 3^{\cos 3x^4} \cdot \sin 3x^4 \cdot \ln 3$$

$$8) y = \log_5 (\tan(4x^4))$$

$$\frac{dy}{dx} = \frac{16x^3 \sec^2(4x^4)}{\tan(4x^4) \ln 5}$$

Evaluate each indefinite integral.

$$9) \int \frac{12x^2}{x^3+2} dx$$

$$4 \ln|x^3+2| + C$$

$$17) \int \frac{20e^{5x}}{e^{5x}+3} dx$$

$$4 \ln|e^{5x}+3| + C$$

18)

$$\int 80x^3(3)^{5x^4} dx$$

$$\frac{4 \cdot 3^{5x^4}}{\ln 3} + C$$

19)

$$\int \frac{2}{x(\ln(4x))} dx$$

$$2 \ln|\ln 4x| + C$$