解答

1. (1) $5\cos(5x+2)$ (2) $\dfrac{2}{\cos^2 2x}$

(3) $5e^{5x}$ (4) $-\dfrac{3}{e^x}$

2. (1) 6 (2) -4

3. (1) $\dfrac{3}{3x+1}$ (2) $\dfrac{2}{2x-3}$

(3) $4^x \log 4$ (4) $7^x \log 7$

(5) $\dfrac{2}{(2x-5)\log 4}$ (6) $\dfrac{4}{(4x-1)\log 6}$

(7) $\dfrac{4}{4x+3}$ (8) $\dfrac{3}{3x+2}$

解説

1. (1) $y' = 5 \cdot \cos(5x+2) = 5\cos(5x+2)$

(2) $y' = 2 \cdot \dfrac{1}{\cos^2 2x} = \dfrac{2}{\cos^2 2x}$

(3) $y' = 5 \cdot e^{5x} = 5e^{5x}$

(4) $y' = (3e^{-x})' = -1 \cdot 3e^{-x} = -3e^{-x} = -\dfrac{3}{e^x}$

2. (1) $\log e^6 = 6\log e = 6 \cdot 1 = 6$

(2) $\log \dfrac{1}{e^4} = \log e^{-4} = -4\log e = -4 \cdot 1 = -4$

3. (1) $(\log x)' = \dfrac{1}{x}$ を用いて

$y' = 3 \cdot \dfrac{1}{3x+1} = \dfrac{3}{3x+1}$

(2) $(\log x)' = \dfrac{1}{x}$ を用いて

$y' = 2 \cdot \dfrac{1}{2x-3} = \dfrac{2}{2x-3}$

(3) $(a^x)' = a^x \log a$ を用いて $y' = 4^x \log 4$

(4) $(a^x)' = a^x \log a$ を用いて $y' = 7^x \log 7$

(5) $(\log_a x)' = \dfrac{1}{x\log a}$ を用いて

$y' = 2 \cdot \dfrac{1}{(2x-5)\log 4} = \dfrac{2}{(2x-5)\log 4}$

(6) $(\log_a x)' = \dfrac{1}{x\log a}$ を用いて

$y' = 4 \cdot \dfrac{1}{(4x-1)\log 6} = \dfrac{4}{(4x-1)\log 6}$

(7) $(\log|x|)' = \dfrac{1}{x}$ を用いて

$y' = 4 \cdot \dfrac{1}{4x+3} = \dfrac{4}{4x+3}$

(8) $(\log|x|)' = \dfrac{1}{x}$ を用いて

$y' = 3 \cdot \dfrac{1}{3x+2} = \dfrac{3}{3x+2}$