

① Solve: $\log_3(2-5x) = 3$

② Solve: $3(7^{5x-1}) = 90$

① $3^3 = 2-5x$

$27 = 2-5x$
 $-2 \quad -$

$25 = -5x$
 $-5 \quad -$

$x = -5$

② $7^{5x-1} = 30$

$\log_7 30 = 5x-1$
 $+1 \quad +1$

$\frac{1+\log_7 30}{5} = \frac{5x}{5}$

$x = \frac{1+\log_7 30}{5}$

③ $f(x) = 7^{\frac{x^5}{3}}$
find $f'(x)$

④ $\int 2x^2(3^{-2x^3}) dx$

⑤ $F(x) = \int_8^{3e^x} \frac{t-1}{t} dt$
find $F'(x)$

③ $f'(x) = (\ln 7) \left(7^{\frac{x^5}{3}}\right) \left(\frac{5x^4}{3}\right)$

④ $u = -2x^3$ $\frac{du}{-6} = \frac{-6x^2 dx}{-6}$ $-\frac{2}{6} \int 3^u du = -\frac{1}{3 \ln 3} (3^u) + c$ $\frac{-3^{-2x^3} + c}{3 \ln 3}$
 $\frac{du}{-6} = x^2 dx$

or $\frac{-1}{3(3^{2x^3}) \ln 3} = \frac{-1}{(3^{2x^3+1}) \ln 3} + c$

⑤ $\left(\frac{3e^x - 1}{3e^x}\right) (3e^x) = 3e^x - 1$

$$\textcircled{6} \quad y = \frac{\arctan(3-x^2)}{5}$$

Find y'

$$\textcircled{6} \quad y' = \frac{-2x}{5(1+(3-x^2)^2)}$$

$$\textcircled{7} \quad \int \frac{3}{x\sqrt{16x^2-11}} dx$$

$$\textcircled{7} \quad u = 4x \quad \frac{du}{4} = \frac{4dx}{4} \quad \frac{du}{4} = dx$$

$$\frac{3}{4} \int \frac{4du}{4x\sqrt{u^2-(\sqrt{11})^2}} = 3 \int \frac{du}{u\sqrt{u^2-(\sqrt{11})^2}}$$

$$\frac{3}{\sqrt{11}} \operatorname{arcsec} \left| \frac{4x}{\sqrt{11}} \right| + C$$