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연습문제 5.3)

1. 다음 방정식을 풀어라.

(1) $3\ln x = \ln 27$

sol).

$\ln x^3 = \ln 27$

$x^3 = 27$

$\therefore x = 3$

(2) $\log_3(4x-7) = 2$

sol).

$4x-7 = 3^2$

$4x = 9+7$

$4x = 16$

$\therefore x = 4$

(3) $\log_5 x + \log_5(2x-3) = 1$

sol)

$\log_5 x(2x-3) = 1$

$x(2x-3) = 5$

$2x^2 - 3x - 5 = 0$

$(2x-5)(x+1) = 0$

$\therefore x = \frac{5}{2}$

$\therefore x = -1$

2. 다음 식의 값을 계산하여라.

(1) $\log_3 81$

sol1).

$\log_3 3^4 = 4\log_3 3 = 4$

sol2).

$81 = 3^x$ $\therefore x = 4$

(2) $\ln e^{\sqrt{2}}$

sol1)

$\log_e e^{\sqrt{2}} = \sqrt{2}\log_e e = \sqrt{2}$

sol2)

$\log_e e^{\sqrt{2}} \Rightarrow e^{\sqrt{2}} = e^x$ $\therefore x = \sqrt{2}$

(3) $e^{\ln 0.1}$

sol).

$e^{\log_e 0.1} = e^{(\log_e 1 - \log_e 10)} = e^{-\log_e 10} = e^{-\log_e \frac{1}{e^{-1}}} = e^{-(\log_e 1 - \log_e e^{-1})}$

$= e^{\log_e e^{-1}} = e^{-1} = 0.1$

$\log_e 0.1 = 0.1 = e^x$

$\frac{1}{10} = e^x$

$10 = \frac{1}{e^x}$

다: 0.1.