

(1) Simplify

(a) $\log_3(27)$ 3

(b) $\log_2(\frac{1}{2})$ -1

(c) $\log_5(\sqrt[3]{5})$ $\frac{1}{3}$

(d) $\log_2(\frac{1}{\sqrt{2}})$ $-\frac{1}{2}$

(e) $\log_{27}(9)$ $\frac{2}{3}$

(f) $\ln(e^2)$ 2

(g) $e^{\ln(2x)}$ $2x$

(h) $e^{2\ln(x)} = e^{\ln(x^2)} = x^2$

(i) $e^{-\ln(x)} = e^{\ln(\frac{1}{x})} = \frac{1}{x}$

(2) Find $\log_7(4)$ to 3 decimal places.

$$\log_7(4) = \frac{\log(4)}{\log(7)} = 0.712$$

(3) Solve

(a) $2^x = 3$ $x = \log_2(3)$

(b) $\ln(4+x) = 3$ $4+x = e^3$ $x = e^3 - 4$

(c) $\ln(x+2) = 3 + \ln(x)$ $\ln(x+2) - \ln(x) = 3$

(d) $e^{2x} + 4e^x - 5 = 0$ $\ln\left(\frac{x+2}{x}\right) = 3$

$$1 + \frac{1}{x} = e^3$$

$$\frac{1}{x} = e^3 - 1$$

$$x = \frac{1}{e^3 - 1}$$

1) $(e^x)^2 + 4e^x - 5 = 0$

$$(e^x + 5)(e^x - 1) = 0$$

$$e^x = -5$$

no solution

$$e^x = 1 \Rightarrow x = 0$$