$\ln(x^2 - 2x) = \ln(5x - 12)$

$e^{\ln(x^2-2x)} = e^{\ln(5x-12)}$ $x > \frac{12}{5}$

$x^2 - 2x = 5x - 12$

$x^2 - 7x + 12 = 0$

$(x-4)(x-3)$

$x = 4, 3$ ✓

$\ln(6x) - \ln(4 - x) = \ln 3$

$e^{\ln\left(\frac{6x}{4-x}\right)} = e^{\ln 3}$

$6x = 3(4-x)$

$x = 4/3$ ✓

$\ln x + \ln(x + 3) = \ln(20 - 5x)$

$e^{\ln(x(x+3))} = e^{\ln(20-5x)}$

$x^2 + 3x = 20 - 5x$

$x^2 + 8x - 20 = 0$

$(x+10)(x-2) = 0$

$x = -10, 2$

$\ln(-x) + \ln(6 - x) = 2$

$e^{\ln(-x(6-x))} = e^2$

$x^2 - 6x - e^2 = 0$

$x = \frac{6 - \sqrt{36 + 4e^2}}{2}$ ✓

$\log_2(x - 1) = \log_4 x$

$2^{\log_2(x-1)^2} = 2^{\log_2 x}$

$(x-1)^2 = x$

$x^2 - 3x + 1 = 0$

$x = \frac{3 + \sqrt{5}}{2}$

the −ve is not in domain

$\ln x + \log x = 1$

$\ln x + \ln x^{\frac{1}{\ln 10}} = 1$

$e^{\ln\left(x^{1+\frac{1}{\ln 10}}\right)} = e^1$

$\left(x^{1+\frac{1}{\ln 10}} = e^1\right) \Rightarrow x = 2.008\ldots$

$50 = -3 \cdot 2^{x-1} + 83$

$50 = -3\left(e^{\ln 2}\right)^{x-1} + 83$

$\ln\left(\frac{50-83}{-3}\right) \cdot \frac{1}{\ln 2} + 1 = x = 4.46$

$\ln\left(\frac{50-83}{-3}\right) = \ln\left(2^{x-1}\right)$ $(x-1)$

$13 = \frac{5}{2} \cdot \left(\frac{4}{3}\right)^{\frac{x+2}{3}} + 4$

$13 = \frac{5}{2}\left(e^{\ln(4/3)}\right)^{\frac{x+2}{3}} + 4$

$\ln\left((13-4)\frac{2}{5}\right) \cdot \frac{1}{\ln(4/3)} \cdot 3 - 2 = x$

$x = 11.357\ldots$

$\ln\left[(13-4)\frac{2}{5}\right] = \ln\left(\frac{4}{3}\right)^{\frac{x+2}{3}}$

$$\ln x + \log x = 1$$

$$\ln x + \frac{\ln x}{\ln 10} = 1$$

$$\ln x + \frac{1}{\ln 10} \cdot \ln x = 1$$

$$\ln x + \ln x^{\frac{1}{\ln 10}} = 1$$

$$e^{\ln\left(x^{1+\frac{1}{\ln 10}}\right)} = e^1$$

$$x^{1+\frac{1}{\ln 10}} = e \qquad 1+\frac{1}{\ln 10} = a$$

$$x^a = e \rightarrow \quad x = e^{\frac{1}{a}}$$