Pg. 217, #29

Solve: $\left(\frac{2}{3}\right)^x = \frac{81}{16} = \frac{3^4}{2^4} = \left(\frac{3}{2}\right)^4 = \left(\frac{2}{3}\right)^{-4}$

Since $\left(\frac{2}{3}\right)^x = \left(\frac{2}{3}\right)^{-4}$ we have $\boxed{x = -4}$

Pg. 218, #60

Solve: $100\,e^{0.005x} = 125{,}000$

$\Rightarrow e^{0.005x} = 1{,}250 \Rightarrow \ln e^{0.005x} = \ln 1250$

$\Rightarrow 0.005x = \ln 1250 \Rightarrow x = \frac{\ln 1250}{0.005} = \boxed{1426.180}$

Pg. 218, #75

Solve: $e^{x^2-3x} = e^{x-2}$

$\Rightarrow x^2 - 3x = x - 2 \Rightarrow x^2 - 4x + 2 = 0$

By the QF: $x = \frac{4 \pm \sqrt{16-4(2)}}{2} = \frac{4 \pm \sqrt{8}}{2}$

$= 2 \pm \sqrt{2} = \boxed{3.414 \text{ or } 0.586}$

Pg. 218, #106

Solve: $\ln \sqrt{x-8} = 5$

$\Rightarrow \ln (x-8)^{1/2} = 5 \Rightarrow \frac{1}{2}\ln(x-8) = 5$

$\Rightarrow \ln(x-8) = 10 \Rightarrow x - 8 = e^{10}$

$\Rightarrow x = 8 + e^{10} = \boxed{22034.466}$