II. a. $3(x+2)\log(10) = (3x+6)(1) = \boxed{3x+6}$

b. $\log_3(9^{4-x}) = (4-x)(\log_3 9) = (4-x)(2) = \boxed{8-2x}$

c. $\log(2x^2) - \log(8x^5) + \log(x^3)$

$= \log\left(\frac{2x^2 \cdot x^3}{8x^5}\right) = \log\left(\frac{2x^5}{8x^5}\right) = \log\left(\frac{1}{4}\right) = \boxed{-\log 4}$

d. $\log_3 7 \log_7 5 \log_5 2 \log_2 27 = \log_3 27 = \boxed{3}$

e. $\log_5 2 - \log_{25} 36$

$= \log_5 2 - \log_{5^2} 6^2$

$= \log_5 2 - \log_5 6 = \log_5\left(\frac{2}{6}\right) = \log_5\left(\frac{1}{3}\right) = \boxed{-\log_5 3}$

III. $4(2)^x = \frac{1}{5}(4)^x$

$20 = \frac{(4)^x}{(2)^x} \rightarrow 20 = 2^x$

$\log(20) = \log(2^x) \rightarrow \log 20 = x\log(2)$

$\boxed{x = \frac{\log(20)}{\log(2)} \approx 4.322}$

$3^{x-2} = 16$

$3^x \cdot 3^{-2} = 16 \rightarrow \frac{3^x}{9} = 16 \qquad 3^x = 144$

$x\log 3 = \log 144$

$\boxed{x = \frac{\log 144}{\log 3} \approx 4.524}$