Base "e" assignment

1. $e^3 = x$

   $\ln e^3 = \ln x$

2. $e^x = 36.$

   $x \ln e = \ln 36$

3. $e^{x-9} = 74$

   $\ln [e^{x-9}] = \ln 74$

   $x-9 \ln e = \ln 74$

4. $\ln 53 = x \ln e$

   $\ln 53 = \ln e^x$

   $3.97 = \ln e^x$

   $x = 3.97.$

   $e^y = x = \ln 53$

   $e^{\ln 53} = x$

5. $\ln x = 18$

   $e^{\ln x} = e^{18}$

   $x = e^{18}$

6. $\ln 87 = x+4$

   $e^{\ln 87} = x+4$

7. $\ln 4 + \ln 3x = \ln |4(3x)| = \ln |12x|$

8. $\frac{1}{2} \ln 256 - 3 \ln 2. = \ln 256^{1/2} - \ln 2^3 = \ln 16 - \ln 8$

   $= \ln \left| \frac{16}{8} \right| = \ln 2$

9. $7\ln a - 4\ln b$

$\ln a^7 - \ln b^4 = \ln\left|\frac{a^7}{b^4}\right|$

10. $\ln(2m^8) = \ln 2 + \ln m^8 = \ln 2 + 8\ln m$

$= \ln 2 + 8\ln m$

11. $\ln\left(\frac{m^5}{n^2}\right)^3 = 3\left[\ln m^5 - \ln n^2\right]$

$= 3\left[5\ln m - 2\ln n\right]$

12. $\ln\sqrt{r^8 s^5} = \ln r^4 \cdot s^{5/2} = 4\ln r + \frac{5}{2}\ln s$

13. $\ln(9x-7) = \ln(5x+33)$

$9x - 7 = 5x + 33$

$4x = 41$

$x = 41/4$

14. $\ln(2x^2 - 15) = \ln(x^2 + 34)$

$2x^2 - 15 = x^2 + 34$

$x^2 = 49$

$x = \pm\sqrt{49} = \pm 7$

15. $\ln 60 - \ln 4 = \ln(x^2 + 2x)$

$\ln\left(\frac{60}{4}\right) = \ln(x^2 + 2x)$

$\ln 15 = \ln(x^2 + 2x)$

$15 = x^2 + 2x$

$x^2 + 2x - 15 = 0$

$x = 3$ & $x = -5$

16. $\ln 8 + \ln(n-9) = 5 \ln 2$

$\ln (8 \cdot (n-9)) = \ln 2^5$

$\ln (8n - 72) = \ln 32$

$8n - 72 = 32$

$8n = 104 \quad n = 13$

17. $\ln(4w + 9) = 5$

$4w + 9 = e^5$

$4w + 9 = 148.413$

$w = 34.85$

18. $\ln k - \ln 14 = 2$

$\ln \frac{k}{14} = e^2$

$\frac{k}{14} = e^2 = 7.389$

$k = 14(7.389) = 103.45$

19. $e^x = 21$

$\ln e^x = \ln 21$

$x = \ln 21 = 3.0445$

20. $-2e^c + 14 = -6$

$\frac{-20}{-2} = \frac{-2e^c}{-2}$

$e^c = 10$

$c \ln e = \ln 10$

$c = \ln 10 = 2.3025$

21. $e^{y-1} - 27 = 54$

$e^{y-1} = 81$

$(y-1) \ln e = \ln 81$

$(y-1) = \ln 81$

$y = 1 + \ln 81 = 5.394$

22. $4e^{3k} + 1 = 85$

$\frac{4e^{3k}}{4} = \frac{84}{4}$

$e^{3k} = 21$

$3k \ln e = \ln 21$

$\frac{3k}{3} = \frac{3.0445}{3} \Rightarrow k = 1.0148$

23. $e^{5-2p} + 2 = 4$

$e^{5-2p} = 2$

$5 - 2p \ln e = \ln 2$

$5 - 2p = 0.6932$

$p = 2.153$

24. $3e^{4m-7} - 8 = 106$

$\frac{3}{3}e^{4m-7} = \frac{114}{3}$

$e^{4m-7} = 38$

$\ln e^{4m-7} = \ln 38$

$4m - 7 = \ln 38 = 3.6376$

$\frac{4m}{4} = \frac{10.6376}{4}$

$m = 2.65594$