Pg. 289

$\ln 2^3 = \ln 8$

1) $3\ln 2 + \ln x$

3) $\log 3 - \log x$

5) $5\log_2 y$

7) $3\log x + 2\log y$

9) $2\ln x - 3\ln y$

11) $\frac{1}{4}\log x - \frac{1}{4}\log y$

13) $\log xy$

15) $\ln\left(\frac{y}{3}\right)$

17) $\log \sqrt[3]{x}$

19) $\ln(x^2 y^3)$

21) $\log\left(\frac{x^4 y}{z^3}\right)$

$4\log xy - 3\log yz$

$\log \frac{x^4 y^4}{y^3 z^3}$

Pg. 301

1) 10

3) 12

5) -3

7) 10,000

9) 5.25

11) ≈ 24.2151

13) ≈ 39.6084

15) ≈ -0.4055

17) ≈ 4.3956

$3\ln(x-3) + 4 = 5$

$3\ln(x-3) = 1$

$\ln(x-3) = \frac{1}{3}$

$\log_e$

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

$e^{1/3} + 3 = x$

Pg 311

21) 6.63 years

30) 17.62 years

31) 7.7016 years
$48 217. 82

33) 17.33%
$127,816.26

21)

$A = P\left(1 + \frac{r}{n}\right)^{nt}$

$P = 2300$
9%
$n = 4$
$A = 4150$
$t = ?$

$\frac{4150}{2300} = \frac{2300}{2300}\left(1 + \frac{0.09}{4}\right)^{4t}$

$\ln \frac{4150}{2300} = 4t \ln\left(1 + \frac{0.09}{4}\right)$

$\frac{\ln\left(\frac{4150}{2300}\right)}{\ln\left(1 + \frac{0.09}{4}\right)} = 4t$

30)

6.25%
$A = 12$

$3000 = 1000\left(1 + \frac{0.0625}{12}\right)^{12t}$

$\ln 3 = \ln\left(1 + \frac{0.0625}{12}\right)^{12t}$

$A = Pe^{rt}$