

3.3 p217

$$51. \log_9 \frac{1}{18} \quad \log_9 \frac{1}{2} - 1$$

$$\log_9 (18^{-1})$$

$$\log_9 (9 \cdot 2)^{-1}$$

$$\log_9 (9^{-1} \cdot 2^{-1})$$

$$\log_9 9^{-1} + \log_9 2^{-1}$$

$$-1 + \log_9 2^{-1}$$

$$-1 + \log_9 \frac{1}{2}$$

$$\log_9 \frac{1}{2} - 1$$

3.3 p217

$$\text{bl. } \log_5 \frac{1}{250}$$

$$\log_5 \left(\frac{1}{125} \cdot \frac{1}{2} \right)$$

$$\log_5 5^{-3} + \log_5 \frac{1}{2}$$

$$-3 + \log_5 \frac{1}{2}$$

$$-3 + \log_5 2^{-1}$$

$$-3 + -1(\log_5 2)$$

$$-3 - \log_5 2$$

$$\begin{aligned} 25 \cdot 10 \\ 5^2 \cdot 5 \cdot 2 \\ 125 \cdot 2 \\ 5^3 \cdot 2 \end{aligned}$$

3.4 p229

$$77. \ln x + \ln(x-2) = 1$$

$$\ln x(x-2) = 1$$

$$e^{\ln x^2 - 2x} = e^1$$

$$x^2 - 2x = 2.718$$

$$x^2 - 2x - 2.718 = 0$$

$$x = \frac{2 \pm \sqrt{2^2 - 4(1)(-2.718)}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{4 + 10.872}}{2}$$

$$x = \frac{2 \pm \sqrt{14.872}}{2}$$

$$x = \frac{2 \pm 3.856}{2}$$

$$x = 2.928$$

~~$$x = -0.928$$~~

$$51. \left(1 + \frac{.065}{365}\right)^{365t} = 4$$

$$\log \left(1 + \frac{.065}{365}\right)^{365t} = \log 4$$

$$\frac{365t \log \left(1 + \frac{.065}{365}\right)}{\log \left(1 + \frac{.065}{365}\right)} = \frac{\log 4}{\log \left(1 + \frac{.065}{365}\right)}$$

$$\frac{365t}{365} = \frac{7785.269}{365}$$

$$t = 21.330$$

$$89. \quad 2^x - 7 = 0$$

Zero

$$x = 2.807$$

$$2^x = 7$$

$$y_1 = 2^x$$

$$y_2 = 7$$

Intersect

$$2^x = 7$$

$$\log 2^x = \log 7$$

$$x \frac{\log 2}{\log 2} = \frac{\log 7}{\log 2}$$

$$x = 2.807$$

101. 3.4 p289

$$V = 6.7 e^{-48.1/t}$$

$$1.3 = 6.7 e^{-48.1/t}$$

$$y_1 = 6.7 e^{-48.1/t} - 1.3$$

2nd
Calc
Zero
29.3 yrs

$$y_1 = 6.7 e^{-48.1/t} - 2 \quad 39.8 \text{ yrs}$$