

HW 72

P415

AAT

44. $\log_2 32 = x - 3$

$$\frac{\log 32}{\log 2} + 3 = x$$

$$\boxed{x \approx 8}$$

45. $\log_2 565 = 3 - x$

$$\frac{\log 565}{\log 2} - 3 = -x$$

$$\boxed{x \approx -6.142}$$

46. $\log_8 431 = -2 - x$

$$\frac{\log 431}{\log 8} + 2 = -x$$

$$\boxed{x \approx -4.917}$$

47. $10^{3x} = 1.5$

$$\log 1.5 = 3x$$

$$\boxed{x \approx 0.059}$$

55. $-2^e e^x = -2$

$$e^x = 1$$

$$\boxed{x = 0}$$

56. $3e^x = 25$

$$e^x = 25/3$$

$$\ln(25/3) = x$$

$$\boxed{x \approx 2.12}$$

57. $\log(2^{3x-1}) - 7 = 9$

$$\log(2^{3x-1}) = 16$$

$$2^{3x-1} = 8/3$$

$$\log_2 8/3 = 3x - 1$$

$$\frac{\log 8/3}{\log 2} + 1 = 3x$$

$$\boxed{x \approx 0.805}$$

58. $8(4^{6-2x}) = 28$

$$4^{6-2x} = 3.5$$

$$\log_4 3.5 = 6 - 2x$$

$$\frac{\log 3.5}{\log 4} - 6 = -2x$$

$$\boxed{x \approx 2.548}$$

109. $\log_4 \left(\frac{x}{x-1} \right) = \frac{1}{2}$

$$4^{1/2} = \frac{x}{x-1}$$

$$2 = \frac{x}{x-1}$$

$$2x - 2 = x$$

$$-2 = -x$$

$$\boxed{x = 2}$$

$$110. \log_3(x(x-8)) = 2$$

$$3^2 = x^2 - 8x$$

$$0 = x^2 - 8x - 9$$

$$0 = (x-9)(x+1)$$

$$\boxed{x=9} \quad \cancel{x=-1}$$

$$117. a) 5000 = 2500e^{0.05t}$$

$$2 = e^{0.05t}$$

$$\ln 2 = 0.05t$$

$$\frac{\ln 2}{0.05} = t$$

$$\boxed{13.863 \approx t}$$

$$b) 7500 = 2500e^{0.05t}$$

$$3 = e^{0.05t}$$

$$\ln 3 = 0.05t$$

$$\boxed{t \approx 21.972}$$