

Worksheet 47 - Exponential Functions

1. Solve exactly:

(a) $6(2^{3x-1}) - 7 = 9$

(b) $e^{2x} - 4e^x - 5 = 0$

(c) $e^{4x} - 3e^{2x} - 4 = 0$

(d) $\frac{500}{100 - e^{x/2}} = 20$

(e) $\left(1 + \frac{0.10}{12}\right)^{12t} = 2$

(f) $\ln x + \ln(x + 2) = 1$

(g) $\ln(x + 5) = \ln(x - 1) - \ln(x + 1)$

(h) $\log(8x) - \log(1 + \sqrt{x}) = 2$

2. The demand equation for a microwave oven is given by $p = 500 - 0.5e^{0.0004x}$. Find the demand x for a price of $p = \$350$.

3. The yield V (in millions of cubic feet per acre) for a forest at age t years is given by

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

- (a) Graph the function using your graphing calculator.

- (b) Determine the horizontal asymptote of the function and interpret its meaning in context of the problem.

- (c) Find the time necessary to obtain a yield of 1.3 million cubic feet.

4. The number y of hospitals in the US from 1995 to 2002 can be modeled by

$$y = 7312 - 630.0 \ln t, \quad 5 \leq t \leq 12$$

where t represents the year, with $t = 5$ corresponding to 1995. During which year did the number of hospitals reach 5800?