Math 12

Exponential Equations Worksheet

1. Solve:
   (a) $2^{x-1} = 8$ (b) $9^{1-2x} = 81$

2. Consider the equation $5^{3x+2} = 25^{2x}$. Solve the equation in each way.
   (a) By expressing each side as a power of 5
   (b) By taking the base-5 logarithm of each side
   (c) By taking the base-10 logarithm of each side.

3. Solve:

   (a) $9^{x+1} = 27$ (b) $9^{x+1} = 81$

   (c) $5(2^x) = 40$ (d) $10(3^x)=270$

(e) $2(12)^x = 6^{x+1}$ (f) $2(3)^x = 5^{x-1}$

4. Solve in exact form:

(a) $2(3)^x = 4^x$ (b) $3^x = 2(4)^x$

5. Solve for x in terms of a, b, and c.

(a) $ab^x = c^{x+2}$ (b) $ab^x = c^{x+3}$

Answers: (1) a) 4 b) -1/2 (2) 2
(3) a) ½ b) 1 c) 3 d) 3 e) 1.585 f)4.508
(4) a) $\frac{\log 2}{\log 4 - \log 3}$ (b) $\frac{\log 2}{\log 3 - \log 4}$
(5) a) $\frac{\log a - 2\log c}{\log c - \log b}$ (b) $\frac{\log a - 3\log c}{\log c - \log b}$