Use Logarithms to Solve Exponentials

Strategy

Rewrite the exponential as a logarithm and solve the resulting equation. A calculator will typically be required to look up logarithm for a final answer.

Example **Solve for x** $5(2.4)^x - 2 = 13$

$$5(2.4)^x = 15$$
$$(2.4)^x = 3$$
$$\log (2.4)^x = \log 3$$
$$x \log (2.4) = \log 3$$
$$x = \frac{log\ 3}{log\ 2.4} \text{ (use calculator)}$$

Solve the following equations

1. $5^x = 9$

2. $2^x = 5$

3. $0.7^x = 4$

4. $6^{x+3} = 3^{2x-3}$

5. $4(1.10)^x + 3 = 18$

6. $e^{3x-3}\, e^{-x} = 2e$

Leave answers in terms of logarithms

7. **Solve for w;** $P = \frac{E}{M}(1 - e^{\frac{-Mw}{9}})$

8. **Solve for t;** $A = R(1 + \frac{D}{n})^{tn}$