Solving: *Exponential Equations*

Solve the equation or inequality.

1. $81 = 3^x$
2. $4^x = 7$
3. $5^{x-3} = 15$
4. $2^m = \frac{1}{16}$
5. $36 = 2(1.04)^t$
6. $125 = 25^x$
7. $4^x = 37$
8. $200 = 300(0.87)^t$
9. $12^{2x-7} = 129$
10. $2(3^x) = 10$
11. $13^{x+5} = 27$
12. $325 = 5(1.27)^t$

ANSWERS: Note any $\frac{\log a}{\log b}$ can be written as $\log_b a$ by the change-of-base property.

1. $x = 4$
2. $x = \frac{\log 7}{\log 4}$ $x \approx 1.404$
3. $x = \frac{\log 15}{\log 5} + 3$ $x \approx 4.683$
4. $m = -4$
5. $t = \frac{\log 18}{\log 1.04}$ $t \approx 73.695$
6. $x = \frac{3}{2}$
7. $x = \frac{\log 37}{\log 4}$ $x \approx 2.605$
8. $t = \frac{\log\left(\frac{2}{3}\right)}{\log(0.87)}$ $t \approx 2.912$
9. $x = \frac{\left(\frac{\log 129}{\log 12}\right) + 7}{2}$ $x \approx 4.478$
10. $x = \frac{\log 5}{\log 3}$ $x \approx 1.465$
11. $x = \frac{\log 27}{\log 13} - 5$ $x \approx -3.715$
12. $t = \frac{\log 65}{\log 1.27}$ $t \approx 17.465$