

ANSWERS

MORE PRACTICE: Evaluating Logarithms

Evaluate the following logarithms:

1. $\log 2$

0.301

2. $\log 6.34$

0.802

3. $\ln 2.7$

0.993

4. $\ln 4$

1.386

5. $\log_2 7$

$= \frac{\log 7}{\log 2} = 2.807$

6. $\log_5 4$

$= \frac{\log 4}{\log 5} = 0.861$

7. $\log_4 2.4$

$= \frac{\log 2.4}{\log 4} = 0.632$

8. $\log_2 8$

$= \frac{\log 8}{\log 2} = 3$

Convert the logarithmic equation to an exponential equation

9. $T = \log_8 k$

$k = 8^T$

10. $Q = \log P$

$P = 10^Q$

11. $4 = \ln x$

$x = e^4$

Solve for x:

12. $x + 1 = \log_8 15$

$x + 1 = \frac{\log 15}{\log 8} = 1.302$

$x + 1 = 1.302$

$x = 0.302$

14. $12 = 4^x$

$x = \log_4 12$

$= \frac{\log 12}{\log 4} = 1.792$

11. $10^x = 6$

$x = \log_{10} 6$

$= \log 6$

$= 0.778$

15. $8 = \frac{1}{2} \cdot 5^x$

$16 = 5^x$

$x = \log_5 16$

$= \frac{\log 16}{\log 5} = 1.723$

13. $7.8 = e^x$

$x = \log_e 7.8$

$= \ln 7.8$

$= 2.054$

16. $7 \cdot 3^x + 4 = 11$

$7 \cdot 3^x = 7 \implies x = \log_3 1$

$3^x = 1 \implies \frac{\log 1}{\log 3} = 0$

17. A boat has 5 barnacles on it. They number of barnacles increases by a factor of 1.5 every day.

$B = 5(1.5)^t$

a) How many barnacles are on the boat in 1 week?

b) How long until there are 200 barnacles? $7 \text{ days} \sim B = 5(1.5)^7 = 85.4 \text{ barnacles}$

$\frac{200}{5} = \frac{5(1.5)^t}{5}$

$40 = 1.5^t$

$t = \log_{1.5} 40 = \frac{\log 40}{\log 1.5} = 9.1 \text{ days}$