

Review of Exponentials and Logarithms

3.1 through 3.3

Rewriting (no calculator)

1. Write in exponential form: $\log_3(a) = 5$

2. Write in logarithmic form: $10^{3x} = 81$

Graphing (no calculator)

3. Sketch a graph of $y = 2^{-x} + 3$

Graphing (no calculator)

4. Sketch a graph of $y = -\log_3(x - 2)$

One to One Property (no calculator)

5. Solve the equation by finding equivalent bases:

$$27^x = \left(\frac{1}{9}\right)^{2x}$$

One to One Property (no calculator)

6. Solve the equation by finding equivalent bases:

$$\log_3(x+6) = 2\log_3(x)$$

Compounding Interest

7. Using the formula $A = P \left(1 + \frac{r}{n} \right)^{nt}$

Find the amount of money, after 5 years, in an account that initially has \$500 with an annual interest rate of 3.2% and is compounded

a) Quarterly

b) Daily

Compounding Interest

8. Using the formula $A = Pe^{rt}$

Find the amount of money, after 5 years, in an account that initially has \$500 with an annual interest rate of 3.2% and is compounded continuously.

Solving a word problem

9. “Loudness” is measured in decibels by the equation

$$dB = 10 \log \left(\frac{I}{I_0} \right)$$

where I is the intensity of the sound and I_0 is the level of sound that can barely be heard.

Considering that prolonged exposure to sounds above 85 decibels can cause hearing loss and that a gunshot from a rifle has an intensity of $I = (2.5 \times 10^{13}) I_0$ should you follow the rules of wearing ear protection when at a rifle range?

Exponential Rate of Growth/Decay

10. When left out unattended, food will decay. Twinkies decay at a rate that is modeled by this equation: $A = 50e^{-.0002t}$

Where the amount is in grams and the time is in days.

If Annika leaves a twinkie on the counter unattended and Michael doesn't gobble it up, how much will still be left 5 days later?

Properties of Logarithms (no calculator)

11. Simplify: $\log_5 \left(\frac{1}{25} \right)$

Properties of Logarithms (no calculator)

12. Expand: $\log_5 \left(\frac{2x^3 y}{5z} \right)$

Properties of Logarithms (no calculator)

13. Expand:

$$\log_9 \frac{9x^4}{\sqrt[3]{y}}$$

Properties of Logarithms (no calculator)

14. Condense to one logarithm:

$$-\log_3 x + 3\log_3 4 - 7\log_3 y$$

Properties of Logarithms (no calculator)

15. Simplify: $-\log_4 64 + \log_4 2 - 4\log_2 4$

Properties of Logarithms (no calculator)

16. Simplify: $\ln(e)^5 - 4\log(100) \bullet e^{\ln\frac{1}{2}}$