

Rewrite the following as a log or exponential equation

$$3^5 = 243$$

$$\log_4 \frac{1}{64} = -3$$

12-2 Logarithms

Objectives:

- I can expand and condense logarithms
- I can solve equations using logarithms
- I can graph a logarithmic function

$$y = e^{x-5}$$

$$\ln(y-1) = \ln x + 2$$

Properties of Logarithms

$$15. \log_b y = x \quad b^x = y$$

$$17. \log_b x = \frac{\ln x}{\ln b} \text{ or } \frac{\log x}{\log b}$$

$$18. \log_b xy = \log_b x + \log_b y$$

$$19. \log_b \frac{x}{y} = \log_b x - \log_b y$$

$$20. \log_b x^r = r \log_b x$$

$$21. \log_b \sqrt[n]{x} = \frac{1}{n} \log_b x$$

Write the following as a sum or difference

$$\log(8xy^4)$$

$$\log_3 \left(\frac{9m^4}{\sqrt[3]{n}} \right)$$

Write the following as a single logarithm

$$\ln x^5 - 2 \ln(xy)$$

Solve the following equations

$$2e^{x-1} + 5 = 80$$

$$20 \left(\frac{1}{2} \right)^{\frac{x}{3}} = 5$$

$$\log(x-1) + \log(x+1) - 3 \log x$$

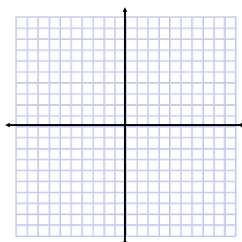
How long will it take to triple a \$250 initial investment in an account that pays 4.5% compounded quarterly?

Solve the following

$$\frac{1}{2}\ln(x+3) - \ln x = 0$$

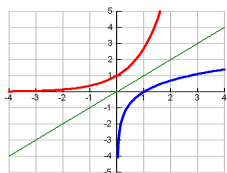
$$\log(x-2) + \log(x+7) = 3\log 4$$

Log Parent Function



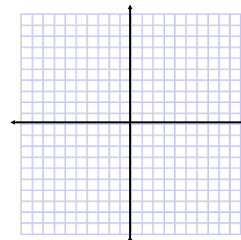
$$f(x) = \ln x$$

$$f(x) = e^x$$



Graph and analyze

$$f(x) = 3\ln(x+2)$$



Domain:

Range:

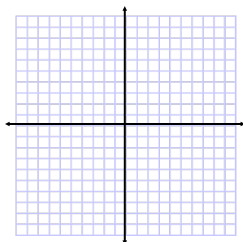
VA:

x-int:

End Behavior:

Graph and analyze

$$f(x) = -\ln(x-3) + 1$$



Domain:

Range:

VA:

x-int:

End Behavior: