

Linear, Quadratic and Exponential Worksheet 2

1. Convert $3^{x^2} + 8 = 20$ into logarithmic form and solve for x .

$$x - 2 = \log_3(12) \implies x = \frac{\ln 12}{\ln 3} + 2.$$

2. Solve the equation $2^x = 16$ using logarithmic form.

$$x = 4.$$

3. Solve the equation $2e^x = 18$ using logarithmic form.

$$x = \ln(9)$$

4. Solve the equation $5^x = 15$ using logarithmic form.

$$x = \frac{\ln 15}{\ln 5}.$$

5. Convert $5 \times 2^{x+6} = 30$ into logarithmic form and solve for x .

$$\log_2 6 = x + 6 \implies x = \frac{\ln 6}{\ln 2} - 6.$$

6. Whenever you see an equation with e in it and you are asked to convert from an exponential to a logarithmic equation which type of logarithm should you use?

The definition of the natural log (shortened to "ln") is \log_e , so when you see e as the base of an exponent, always think natural log.

7. Unless otherwise noted, which base does a logarithm have?

If nothing is written at the base of the log, we should always assume a base of 10. If you ever need to know why, it's because of one simple word: tradition.

8. Solve the equation $e^{2x} - 16 = 0$ using logarithmic form.

$$x = \frac{\ln(16)}{2}.$$

9. If we're trying to find the log of an exponential function, the best way to do this on a calculator is to convert the equation $\log_b x = y$ into what?

Convert into $\frac{\log x}{\log b}$ or $\frac{\ln x}{\ln b}$.

10. What happens when you take the log of a negative number?

You might think taking the log of a negative number is impossible.