



Logarithmic Equations Maze

Directions: Find the solution to each equation to “find the log” and solve the maze. SHOW YOUR WORK!

| | | | | | | |
|---|-------------------|-----------------------------|---------------|--------------------------|-------|---|
| <p>START: $\log_3 81 = x$</p> | 5 | $\log_{27} x = \frac{1}{3}$ | 3 | $\log_5 x = 2$ | 25 | $\log_{32} x = \frac{1}{5}$ |
| 4 | (-4) | 64 | (-64) | -25 | (0.1) | 2 |
| $\log_8 x = \frac{1}{3}$ | 2 | $\log_4 x = 3$ | 12 | $\log_9 x = \frac{1}{2}$ | 3 | $\log 0.01 = x$ |
| -2 | (-9) | 10 | (6) | -6 | (-2) | 10 |
| $\log_{\frac{1}{3}} x = -2$ | 4 | $\log_4 256 = x$ | $\frac{1}{9}$ | $\log_3 x = -2$ | 32 | $\log_{\frac{1}{5}} x = 2$ |
| 9 | ($\frac{1}{9}$) | 5 | (-9) | 9 | (-6) | ($\frac{1}{25}$) |
| $\log_{16} x = \frac{1}{4}$ | 2 | $\log_2 64 = x$ | 6 | $\log_{\sqrt{5}} 5 = x$ | 2 | <p>STOP!</p>  |


Natural Logarithms Equations Maze

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| | | | | | | |
|--------------------------------|---------------------|-------------------------------|-------------------------------|---------------------|-------------|---|
| START! $\ln e^x = 6$ | 4 | $\ln x + \ln 3 = 4$ | $\frac{e^4}{3}$ | $\ln e^{x-2} = 14$ | ln 10 | $e^{x-2} = 5$ |
| 6 | $\frac{7}{2}$ | $\ln\left(\frac{7}{2}\right)$ | $\ln\left(\frac{2}{7}\right)$ | 16 | $2 + \ln 5$ | 7 |
| $\ln x + \ln 4x = 2$ | $\frac{e^2}{4}$ | $4e^x = 14$ | ln 3 | $\frac{x}{e^2} = 4$ | 4 ln 2 | $e^{\ln 3x} = 12$ |
| $\frac{e}{2}$ | $\frac{e^3}{2}$ | $2 \ln 7$ | ln 4.5 | ln 8 | 4 | 36 |
| $-2 + \ln 2x = 1$ | $2e^3$ | $41 - e^{2x} = 5$ | $\frac{3}{2}$ | $e^{2x-3} = 1$ | ln 3 | $\ln x + \ln 5 = 3$ |
| e^6 | $\frac{e^4 + 2}{3}$ | ln 6 | $\frac{2}{3}$ | ln 1.5 | $e^{1.5}$ | $\frac{e^3}{5}$ |
| $\ln(3x - 2) = 4$ | ln 20 | $e^{4x} = 9$ | $\frac{\ln 3}{2}$ | $\ln(x + 1)^2 = 2$ | $e - 1$ | STOP!  |


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|--|---------------|---|---------------|--|-----|---|
| <p>START: $\log_3 81 = x$ $3^x = 81$ $3^x = 3^4$ $x = 4$</p> | 5 | <p>$\log_{27} x = \frac{1}{3}$ $27^{\frac{1}{3}} = x$ $\sqrt[3]{27} = x$ $x = 3$</p> | 3 | <p>$\log_5 x = 2$ $5^2 = x$ $x = 25$</p> | 25 | <p>$\log_{32} x = \frac{1}{5}$ $32^{\frac{1}{5}} = x$ $\sqrt[5]{32} = x$ $x = 2$</p> |
| 4 | -4 | 64 | -64 | -25 | 0.1 | 2 |
| <p>$\log_8 x = \frac{1}{3}$ $8^{\frac{1}{3}} = x$ $\sqrt[3]{8} = x$ $x = 2$</p> | 2 | <p>$\log_4 x = 3$ $4^3 = x$ $x = 64$</p> | 12 | <p>$\log_9 x = \frac{1}{2}$</p> | 3 | <p>$\log 0.01 = x$ $10^x = \frac{1}{100}$ $10^x = 10^{-2}$ $x = -2$</p> |
| -2 | -9 | 10 | 6 | -6 | -2 | 10 |
| <p>$\log_{\frac{1}{3}} x = -2$ $(\frac{1}{3})^{-2} = x$ $(\frac{3}{1})^2 = x$ $x = 9$</p> | 4 | <p>$\log_4 256 = x$ $4^x = 256$ $4^x = 4^4$ $x = 4$</p> | $\frac{1}{9}$ | <p>$\log_3 x = -2$ $3^{-2} = x$ $x = \frac{1}{3^2}$ $x = \frac{1}{9}$</p> | 32 | <p>$\log_{\frac{1}{5}} x = 2$</p> |
| 9 | $\frac{1}{9}$ | 5 | -9 | 9 | -6 | $\frac{1}{25}$ |
| <p>$\log_{16} x = \frac{1}{4}$ $16^{\frac{1}{4}} = x$ $\sqrt[4]{16} = x$ $x = 2$</p> | 2 | <p>$\log_2 64 = x$ $2^x = 64$ $2^x = 2^6$ $x = 6$</p> | 6 | <p>$\log_{\sqrt{5}} 5 = x$ $\sqrt{5}^x = 5$ $5^{\frac{1}{2}x} = 5^1$ $\frac{1}{2}x = 1$ $x = 2$</p> | 2 | <p>STOP! </p> |

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| | | | | | | |
|--|-----------------|--|-------------------------------|---|-------------|--|
| <p>START:</p> $\ln e^x = 6$ $x \ln e = 6$ $x = 6$ | 4 | $\ln x + \ln 3 = 4$ $\ln 3x = 4$ $3x = e^4$ $x = \frac{e^4}{3}$ | $\frac{e^4}{3}$ | $\ln e^{x-2} = 14$ $(x-2) \ln e = 14$ $x-2 = 14$ $x = 16$ | $\ln 10$ | $e^{x-2} = 5$ |
| 6 | $\frac{7}{2}$ | $\ln\left(\frac{7}{2}\right)$ | $\ln\left(\frac{2}{7}\right)$ | 16 | $2 + \ln 5$ | 7 |
| $\ln x + \ln 4x = 2$ $\ln 4x^2 = 2$ $4x^2 = e^2$ $x^2 = \frac{e^2}{4}$ $x = \frac{e}{2}$ | $\frac{e^2}{4}$ | $4e^x = 14$ $e^x = \frac{14}{4}$ $\ln e^x = \ln \frac{7}{2}$ $x \ln e = \ln \frac{7}{2}$ $x = \ln \frac{7}{2}$ | $\ln 3$ | $e^{\frac{x}{2}} = 4$ $\ln e^{\frac{x}{2}} = \ln 4$ $\frac{x}{2} \ln e = 2 \ln 2$ $\frac{x}{2} = 2 \ln 2$ $x = 4 \ln 2$ | $4 \ln 2$ | $e^{\ln 3x} = 12$ $3x = 12$ $x = 4$ |
| $\frac{e}{2}$ | $\frac{e^3}{2}$ | $2 \ln 7$ | $\ln 4.5$ | $\ln 8$ | 4 | 36 |
| $-2 + \ln 2x = 1$ $\ln 2x = 3$ $2x = e^3$ $x = \frac{e^3}{2}$ | $2e^3$ | $41 - e^{2x} = 5$ $e^{2x} = 36$ $\ln e^{2x} = \ln 36$ $2x \ln e = 2 \ln 6$ $x = \ln 6$ | $\frac{3}{2}$ | $e^{2x-3} = 1$ $\ln e^{2x-3} = \ln 1$ $2x-3 \ln e = 0$ $2x-3 = 0$ $x = \frac{3}{2}$ | $\ln 3$ | $\ln x + \ln 5 = 3$ |
| e^6 | $\ln 2.4$ | $\ln 6$ | $\frac{2}{3}$ | $\ln 1.5$ | $e^{1.5}$ | $\frac{e^3}{5}$ |
| $\ln(3x-2) = 4$ | $\ln 20$ | $e^{4x} = 9$ $\ln e^{4x} = \ln 3^2$ $4x \ln e = 2 \ln 3$ $x = \frac{\ln 3}{2}$ | $\frac{\ln 3}{2}$ | $\ln(x+1)^2 = 2$ $2 \ln(x+1) = 2$ $\ln(x+1) = 1$ $x+1 = e^1$ $x = e-1$ | $e-1$ | <p>STOP!</p>  |