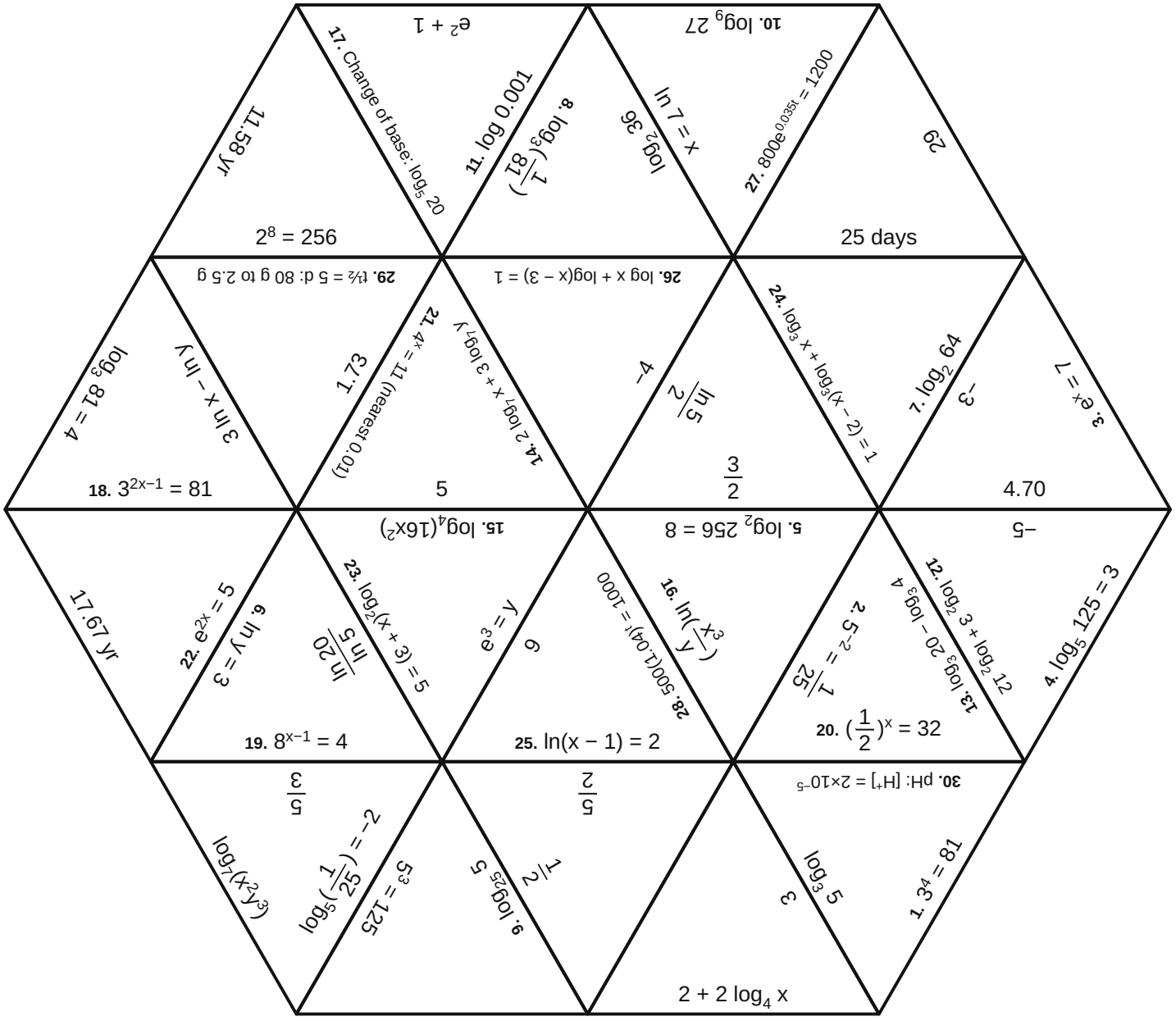
Exp & Log Functions Tarsia

Mr. K's Classroom · Hexagon of 24 triangles, 30 matches Name: _____

Directions: Convert, evaluate, rewrite, or solve each problem. Round only when a problem says to, and check log equations for extraneous solutions. Cut out the 24 triangles. Match each problem to its answer so that touching edges fit, and build a **hexagon**. Glue it on a sheet of paper. Show your work for every problem on the work pages (the number before each problem tells you where).



Show Your Work

Exp & Log Functions Tarsia · Problems 1–15 Name: _____

1. Write in logarithmic form: $3^4 = 81$	**2.** Write in logarithmic form: $5^{-2} = \frac{1}{25}$	**3.** Write in logarithmic form: $e^x = 7$
4. Write in exponential form: $\log_5 125 = 3$	**5.** Write in exponential form: $\log_2 256 = 8$	**6.** Write in exponential form: $\ln y = 3$
7. Evaluate without a calculator: $\log_2 64$	**8.** Evaluate without a calculator: $\log_3(\frac{1}{81})$	**9.** Evaluate without a calculator: $\log_{25} 5$
10. Evaluate without a calculator: $\log_9 27$	**11.** Evaluate without a calculator: log 0.001 (base 10)	**12.** Condense to a single logarithm: $\log_2 3 + \log_2 12$
13. Condense to a single logarithm: $\log_3 20 - \log_3 4$	**14.** Condense to a single logarithm: $2 \log_7 x + 3 \log_7 y$	**15.** Expand using log properties: $\log_4(16x^2)$

Show Your Work

Exp & Log Functions Tarsia · Problems 16–30 Name: _____

16. Expand using log properties: $\ln\left(\frac{x^3}{y}\right)$	**17.** Rewrite $\log_5 20$ using natural logs (change of base).	**18.** Solve for x: $3^{2x-1} = 81$
19. Solve for x: $8^{x-1} = 4$ (rewrite with a common base)	**20.** Solve for x: $\left(\frac{1}{2}\right)^x = 32$	**21.** Solve for x: $4^x = 11$. Round to the nearest hundredth.
22. Solve for x: $e^{2x} = 5$ (exact answer)	**23.** Solve for x: $\log_2(x + 3) = 5$. Check your answer.	**24.** Solve for x: $\log_3 x + \log_3(x - 2) = 1$. Reject any extraneous solution.
25. Solve for x: $\ln(x - 1) = 2$ (exact answer)	**26.** Solve for x: $\log x + \log(x - 3) = 1$. Reject any extraneous solution.	**27.** An account earns 3.5% compounded continuously. How many years until \$800 grows to \$1200? Solve $800e^{0.035t} = 1200$ (nearest hundredth).
28. \$500 earns 4% interest compounded annually. How many years to double? Solve $500(1.04)^t = 1000$ (nearest hundredth).	**29.** A sample has a half-life of 5 days. How many days until 80 g decays to 2.5 g? Solve $80\left(\frac{1}{2}\right)^{\frac{t}{5}} = 2.5$.	**30.** $pH = -\log[H^+]$. Find the pH when $[H^+] = 2\times10^{-5}$ moles per liter (nearest hundredth).