Solving systems of linear equations:

Case 1:

There is one solution \((x, y)\).
The system is called consistent because there is a solution.
The equations are independent because they are not the same equation.

Case 2:

There is no solution, \(\emptyset\).
Since there is no solution, the system is inconsistent.
The equations are independent because they are not the same equation.

Case 3:

Both equations are in the same line.
There are an infinite number of solutions.
\(\{(x, y) \mid ax + by = c\}\)
Since there is a solution, the system is consistent.
The equations are dependent because they are the same equations.
\[ \log_b 1 = 0 \quad \text{and} \quad \log_b b = 1 \]

\[ \log_b x = y \quad \text{implies} \quad b^y = x \]

\[ \log_4 1 + \log_2 1 = 1 + 0 = 1 \]

\[ \log_5 \left( \frac{4 \sqrt{\frac{w^2}{x^2}}}{x} \right) = \log_5 \left( \frac{w^2 z}{x^2} \right)^{\frac{1}{4}} = \frac{1}{4} \log_5 \left( \frac{W^2 z}{x^2} \right) \]

\[ = \frac{1}{4} \left( \log_5 w^3 + \log_5 z^2 - \log_5 x^2 \right) \]

\[ = \frac{1}{4} \left( 3 \log_5 w + \log_5 z^2 - 2 \log_5 x \right) \]

\[ = \frac{3}{4} \log_5 w + \frac{1}{4} \log_5 z^2 - \frac{1}{2} \log_5 x \]

\[ \log_5 8 = \frac{\log 8}{\log 5} \approx 1.3 \]

\[ 6^{x-8} = 13^{-6x} \]

\[ \log_6 6^{x-8} = \log_6 13^{-6x} \]

\[ (x-8) \log 6 = -6x \log 13 \]

\[ x \log 6 - 8 \log 6 = -6x \log 13 \]

\[ x \log 6 + 6 \log 13 = 8 \log 6 \]

\[ x (\log 6 + 6 \log 13) = 8 \log 6 \]

\[ x = \frac{8 \log 6}{\log 6 + 6 \log 13} \]