Expand the Logarithmic Expression

$$\log_2 \left(500 \cdot 2\right)$$

Rewrite $\log_2 \left(500 \cdot 2\right)$ as $\log_2 \left(500\right) + \log_2 \left(2\right)$.

$\log_2 \left(500\right) + \log_2 \left(2\right)$

Logarithm base 2 of 2 is 1.

$\log_2 \left(500\right) + 1$

Simplify each term.

Tap for fewer steps...

Rewrite $\log_2 \left(500\right)$ as $\log_2 \left(2^2 \cdot 5^3\right)$.

$\log_2 \left(2^2 \cdot 5^3\right) + 1$

Rewrite $\log_2 \left(2^2 \cdot 5^3\right)$ as $\log_2 \left(2^2\right) + \log_2 \left(5^3\right)$.

$\log_2 \left(2^2\right) + \log_2 \left(5^3\right) + 1$

Use logarithm rules to move 2 out of the exponent.

$2 \log_2 \left(2\right) + \log_2 \left(5^3\right) + 1$

Logarithm base 2 of 2 is 1.

$2 \cdot 1 + \log_2 \left(5^3\right) + 1$

Multiply 2 by 1.

$2 + \log_2 \left(5^3\right) + 1$

Expand $\log_2 \left(5^3\right)$ by moving 3 outside the logarithm.

$2 + 3 \log_2 \left(5\right) + 1$

Add 2 and 1.

$3 \log_2 \left(5\right) + 3$