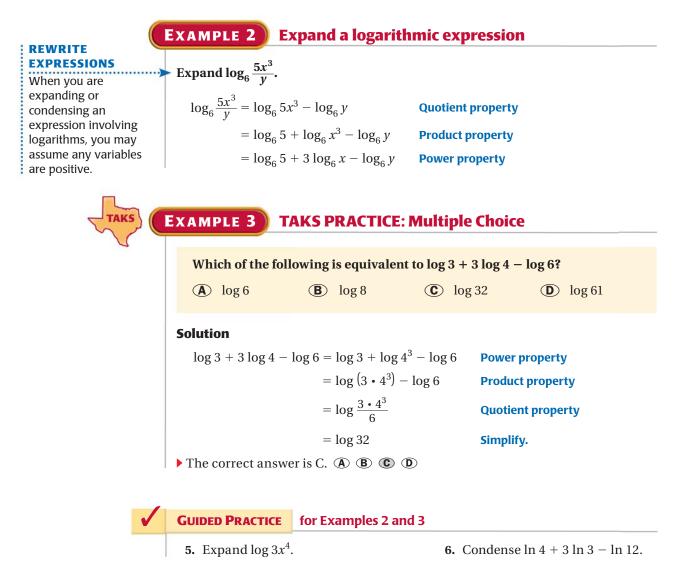
REWRITING EXPRESSIONS You can use the properties of logarithms to expand and condense logarithmic expressions.



CHANGE-OF-BASE FORMULA Logarithms with any base other than 10 or *e* can be written in terms of common or natural logarithms using the *change-of-base formula*. This allows you to evaluate any logarithm using a calculator.

KEY CONCEPTFor Your NotebookChange-of-Base FormulaIf a, b, and c are positive numbers with
$$b \neq 1$$
 and $c \neq 1$, then: $\log_c a = \frac{\log_b a}{\log_b c}$ In particular, $\log_c a = \frac{\log a}{\log c}$ and $\log_c a = \frac{\ln a}{\ln c}$.