(24) $\log 75 = \log 5 \cdot 15$

$= \log 5 + \log 15$

$= 0.699 + 1.176$

$= \boxed{1.875}$

(26) $\log \frac{1}{5} = \log 5^{-1}$

$= -1 \cdot \log 5$

$= -1 \cdot 0.699$

$= \boxed{-0.699}$

(36) $\log_6 \frac{10}{3}$

$= \boxed{\log_6 10 - \log_6 3}$

(44) $\log \sqrt[4]{x^3} = \log x^{\frac{3}{4}}$

$= \boxed{\frac{3}{4} \log x}$

The calculator only uses a base of 10 for logarithms. So when we have a logarithm with any other base, we need another way to evaluate it.

CHANGE OF BASE FORMULA

For any positive real numbers a ≠ 1, b ≠ 1, and x > 0:

numerator

$$\log_b x = \frac{\log_a x}{\log_a b}$$

denominator

Examples
Evaluate each. Round to the thousandths.

14. $\log_7 32 = \dfrac{\log_{10} 32}{\log_{10} 7} \approx 1.781$

15. $\log_{15} 6 = \dfrac{\log_{10} 6}{\log_{10} 15} \approx 0.662$

16. $\log_{\frac{1}{4}} 20 = \dfrac{\log_{10} 20}{\log_{10} \frac{1}{4}} \approx -2.161$