

$$13. 8^{x-3} = 6^{x+2}$$

$$\log 8^{x-3} = \log 6^{x+2}$$

$$(x-3) \log 8 = (x+2) \log 6$$

$$x \log 8 - 3 \log 8 = x \log 6 + 2 \log 6$$

$$-x \log 6 + 3 \log 8 - x \log 6 + 2 \log 6$$

$$x \log 8 - x \log 6 = 2 \log 6 + 3 \log 8$$

$$\frac{x(\log 8 - \log 6)}{\log 8 - \log 6} = \frac{(2 \log 6 + 3 \log 8)}{(\log 8 - \log 6)} = \frac{\log 6^2 + \log 8^3}{\log \frac{8}{6}} = \frac{\log 36 + \log 512}{\log \frac{4}{3}} = \frac{\log 18432}{\log \frac{4}{3}}$$

$$x = 34.1413$$

$$2x - 7 = 6x + 5$$

$$\log_2 32 = 5$$

$$2^n = 32$$

$$\log_2 31$$

Change of base formula:

$$\log_a n = \frac{\log_b n}{\log_b a}$$

Express each logarithm in terms of common logarithms.
Then approximate its value to four decimal places.

14. $\log_4 25$

$$\frac{\log 25}{\log 4}$$

$$2.3219$$

15. $\log_3 56$

$$\frac{\log 56}{\log 3}$$

$$3.6642$$

16. $\log_{13} 1987$

$$\frac{\log 1987}{\log 13}$$

$$2.9608$$

$$\log_2 32 = \frac{\log 32}{\log 2} = 5$$