

Quick Review 1.6

1 Solve each of the following equations:

(a) $\log_{\sqrt{2}} x = 3$ (c) $\log_8 x = \frac{1}{2}$
 (b) $\log_{\frac{1}{\sqrt{2}}} x = -2$ (d) $\log_{\frac{1}{9}} x = -\frac{1}{2}$

2 Solve each of the following equations:

(a) $3 \log_{10} x^2 - 2 \log_{10} \sqrt{x} - 3 \log_{10} x = 4$
 (b) $2 \log_{10} x - \log_x 10 = 1$
 (c) $\log(x+1) + \log x = \log 12$
 (d) $\log_{10} (36x^2 + 25) = \log_{10} x^2 + 2$

3 Solve each of the following simultaneous equations:

(a) $\log_4 x^2 y = 3$
 $(\log_4 x)(\log_4 y) = 1$
 (b) $\log_8 x^3 y = 4$
 $(\log_8 x)(\log_8 y) = 1$
 (c) $\log_4 xy = 2$
 $(\log_8 x)(\log_2 y) = 1$
 (d) $\log_3 (xy) = -3$
 $(\log_9 x)(\log_9 y) = \frac{1}{2}$

4 Solve each of the following equations:

(a) $2^{5x-1} = 3^x$
 (b) $3(2^x) = 5 - 2^{x+2}$
 (c) $5(2^x) = 3 - 2^{x+2}$
 (d) $5^x + 4(5^{x+1}) = 63$

5 Solve each of the following equations:

(a) $2^{2x} + 3(2^x) = 18$
 (b) $(2^x)^2 - 8(2^x) + 15 = 0$
 (c) $3^{2x} - 3^{x+2} - 22 = 0$
 (d) $2(9^x) + 3^{x-1} + 4 = 2(3^{x+1})$

6 Solve each of the following equations:

(a) $2^x 6^{x-2} 7^{x-1} = 5^{2x}$
 (b) $3(4^y) = 3^{x+y}$
 $(2^{2x})(3^{x-3y}) = 2$
 (c) $2(5^x) + 3(3^y) = 19$
 $5(5^x) - 7(3^y) = 4$
 (d) $2^x = 8^{y+1}$
 $3^{x-2} = 9^y$

7 Solve each of the following equations:

(a) $2^x + 12(2^{-x}) = 7$
 (b) $16(2^x) - 15(2^{-x}) = 1$
 (c) $9(3^x) - 3^{-x} + 8 = 0$
 (d) $2(2^x) + 2(2^{-x}) = 5$

8 Solve each of the following equations:

(a) $\log \frac{x+2}{x-2} = \log(x-1)$
 (b) $\log(x^2 - x - 2) = \log(x+1) + \log 2$
 (c) $\log \frac{(x^2-3)}{(1-3x)} = 0$
 (d) $\log x + \log(9-x) = \log 5 + 2 \log 2$

9 Solve each of the following equations:

(a) $10(x^{2 \log_{10} x}) = x^3$
 (b) $10(x^{3 \log_{10} x}) = x^4$
 (c) $x^{2 \log_{10} x} = 10x$
 (d) $x^{\log_2 x} = 8x^{x-2}$

10 Solve each of the following equations:

(a) $\log 143 - \log x = \log y$
 $\log(x+y) - \log(x-y) = \log 12$
 (b) $y^{\log_{10} x} = 10$
 $2 \log_{10} x - \log_{10} y = 1$

11 Solve each of the following inequalities:

(a) $\log_2(x+4) > \log_2(x^2-2)$
 (b) $\log_{0.2}(x+4) > \log_{0.2}(x^2-2)$

12 Solve each of the following inequalities:

(a) $2^{2x} - 5(2^x) + 4 > 0$
 (b) $2^x + 12(2^{-x}) - 7 < 0$

13 Solve each of the following inequalities:

(a) $(0.3)^{x^2+5x-24} > (0.3)^{3x}$
 (b) $(0.5)^{x^2-2x-2} < (0.5)^6$

14 Solve each of the following equations:

(a) $3 \log_8 x - \log_x 64 + 1 = 0$
 (b) $\log_{10}(x+7) + \log_{10}(3x+1) = 2$
 (c) $\log_3(xy) = -3$
 $(\log_9 x)(\log_9 y) = \frac{1}{2}$
 (d) $2x + y = 10, 2^{2x-3y} = 4$