48. (a) Given that $x > 0$, show that
$$\log_a x^n = n \log_a x .$$
[3]

(b) Solve the equation
$$\log_a(3x + 4) - \log_a x = 3 \log_a 2 .$$
[4]

(c) Solve the equation
$$4^{3y+2} = 7,$$
giving your answer correct to three decimal places.
[3]

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49. (a) Given that $x > 0$, $y > 0$, show that
$$\log_a xy = \log_a x + \log_a y.$$
[3]

(b) Solve the equation
$$\log_9 x = -\frac{1}{2} .$$
[2]

(c) Solve the equation
$$\log_a(4x + 7) = \log_a x + 2 \log_a 3.$$
[4]

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50. (a) Given that $x > 0$, $y > 0$, show that
$$\log_a \frac{x}{y} = \log_a x - \log_a y.$$
[3]

(b) Solve the equation
$$3^{5-2x} = 7.$$
Show your working and give your answer correct to three decimal places.
[3]

(c) Solve the equation
$$\log_a(x - 3) + \log_a(x + 3) = 2 \log_a(x - 2).$$
[4]

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