

11.

$$2\log_2(x-4) + \log_2\left(\frac{4}{3}x\right) = 2 + \log_2(x+2)$$

(a) Show that the given equation can be written in the form

$$x^3 - 8x^2 + 13x - 6 = 0 \quad (4)$$

(b) Use the factor theorem to show that $(x-1)$ is a factor of $x^3 - 8x^2 + 13x - 6$ (1)

(c) Hence, using algebra and showing your working, solve the equation

$$x^3 - 8x^2 + 13x - 6 = 0$$

(Solutions relying on calculator technology are not acceptable.) (3)

(d) Hence solve

$$2\log_2(x-4) + \log_2\left(\frac{4}{3}x\right) = 2 + \log_2(x+2) \quad (1)$$