3 Find the possible values of k for which the equation $kx^2 + (k+5)x - 4 = 0$ has real roots. [5]

4 Variables x and y are related by the equation $y = 1 + \frac{2}{x} + \frac{1}{x^2}$ where $x > 0$. Use differentiation to find the approximate change in x when y increases from 4 by the small amount 0.01. [5]

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5 **(a)** Solve the equation $\dfrac{625^{\frac{x^3-1}{2}}}{125^{x^3}} = 5$. [3]

(b) On the axes, sketch the graph of $y = 4e^x + 3$ showing the values of any intercepts with the coordinate axes. [2]

