6 **(a)** **(i)** A 5-digit number is to be formed from the seven digits 0, 1, 2, 3, 4, 5, 6. Each digit can be used at most once in any number and the number does not start with 0. Find the number of ways in which this can be done. [2]

(ii) Find how many of these 5-digit numbers are even. [3]

(b) A team of 7 people is to be selected from a group of 9 women and 6 men. Find the number of different teams that can be selected which include at least one man. [2]

(c) **(i)** Show that ${}^nC_3 + {}^nC_2 = \frac{1}{6}(n^3 - n)$ for $n \geqslant 3$. [5]

(ii) Hence solve the equation ${}^nC_3 + {}^nC_2 = 4n$ where $n \geqslant 3$. [2]

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[Turn over

7 Variables x and y are such that $y = \dfrac{(1+\sin 3x)^4}{\sqrt{x}}$. Use differentiation to find the approximate change in y when x increases from 1.9 to $1.9+h$, where h is small. [6]

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