6 **(a)** Five of the digits 1 2 3 4 5 6 7 8 9 are used to make a 5-digit number.

Find how many ways this can be done when the 5-digit number is greater than 50 000. [2]

(b) In a group of 13 people, 7 have red hair and 6 have brown hair.

(i) The 13 people stand in line for a photograph.
No person with red hair is standing next to another person with red hair.

Find the number of different ways this can be done. [2]

(ii) Chris chooses 5 people from this group.

Find the number of ways Chris can do this if at least 1 person chosen has brown hair. [2]

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7 **(a)** Find the term independent of x in the expansion of $\left(x^2 - \frac{3}{x^4}\right)^{15}$. [2]

(b) In the expansion of $(1+ax)^9$ the coefficient of x^3 is 7 times the coefficient of x^2.

Given that a is a positive constant, find the value of a. [3]

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