2 **(a)** Find the number of different arrangements of the 8 letters in the word KANGAROO in which the two As are together and the two Os are **not** together. [3]

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A fair 8-sided dice has faces labelled K, A, N, G, A, R, O, O. The dice is rolled repeatedly.

(b) Find the probability that fewer than 6 rolls of this dice are required to obtain an A. [2]

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(c) Find the probability that the second A is obtained on the 6th roll of the dice. [2]

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