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**11** **(a)** There are 3 girls and 2 boys standing in a straight line. Find the number of possible orders in each of the following cases.

**(i)** No girls are next to each other. [2]

**(ii)** The 2 boys are not next to each other. [2]

**(b)** 12 people, including Anjie and Bubay, are divided into 3 groups of 4 people. Anjie and Bubay must not be in the same group.

Find the number of ways in which the 3 groups can be selected. [2]

**12** A particle moves in a straight line. Its velocity, $v$ ms$^{-1}$, at time $t$ seconds is given by

$$v = \cos t - \sin t.$$

**(a)** Find the acceleration, $a$ ms$^{-2}$, when $t = \frac{\pi}{3}$. [2]

The displacement of the particle from a fixed point $O$ at time $t$ is $s$ metres. The particle passes through $O$ when $t = 0$.

**(b)** Find the displacement at the time when the particle first changes direction after passing through $O$. [6]

**(c)** Find an expression for $a$ in terms of $s$. [1]

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