Conditions

A can hit target 4 times in 5 shots, B can hit 2 times in 4 shots and C can hit 2 times in 4 shots. Find the probability that
 (i) 2 shots hit.
 (ii) at least two shots hit.

Solution

The probabilities to hit a target for A,B,C are:

$$\frac{4}{5}, \frac{1}{2}, \frac{1}{2}$$

If everyone shots only once, then the probability of 2 shots hit is:

$$\frac{4}{5} \cdot \frac{1}{2} \cdot \frac{1}{2} + \frac{4}{5} \cdot \frac{1}{2} \cdot \frac{1}{2} + \frac{1}{5} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{9}{20}$$

The probability of at least 2 shots hit is:

$$\frac{4}{5} \cdot \frac{1}{2} \cdot \frac{1}{2} + \frac{4}{5} \cdot \frac{1}{2} \cdot \frac{1}{2} + \frac{1}{5} \cdot \frac{1}{2} \cdot \frac{1}{2} + \frac{4}{5} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{13}{20}$$

Answer: (i) $\frac{9}{20}$**, (ii)** $\frac{13}{20}$