1. Two dice are thrown. What is the conditional probability of a total score of at least 8, given that one of the dice has thrown 4 ?

Solution.

Let A means an event which occur when one of the (first) dice has thrown 4.
Let B means an event which occur when total score of at least 8.
Let s_1 - the number of points obtained by the roll of the first dice and s_2 – by the second dice.

$P(A|B) = P(s_1 + s_2 \geq 8|s_1 = 4) = P(s_1 + 4 \geq 8) = P(s_1 \geq 4)$, then

$P(A|B) = P(s_1 = 4) + P(s_1 = 5) + P(s_1 = 6) = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = 0.5$

Answer: 0.5