Quiz Solution

1. In this case, there are six possibilities:

$$(2W, 2B),\ (2W, 2R),\ (2W, 2G),\ (2B, 2R),\ (2B, 2G),\ (2R, 2G)$$

So the desired probability is

$$\frac{\binom{4}{2}\binom{2}{2} + \binom{4}{2}\binom{6}{2} + \binom{4}{2}\binom{3}{2} + \binom{2}{2}\binom{6}{2} + \binom{2}{2}\binom{3}{2} + \binom{6}{2}\binom{3}{2}}{\binom{15}{4}}$$

2. Since

$$\begin{aligned} A &= \{\text{sum of the throws equals 4}\} = \{(1,3),(2,2),(3,1)\} \\ B &= \{\text{at least one of the throws show a 3}\} \\ &= \{(1,3),(3,1),(2,3),(3,2),(3,3),(3,4),(4,3),(3,5),(5,3),(3,6),(6,3)\} \end{aligned}$$

and

$$A \cap B = \{(1,3),(3,1)\}$$

we see that

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{2/36}{11/36} = \frac{2}{11}$$