Question 1

Favorable ways for red = x, blue = 10−x
is $^{40}C_x \cdot {}^{60}C_{10-x}$

Sample space = $\{(0,10), (1,9), (2,8), \ldots, (10,0)\}$

Total ways = $\sum_{x=0}^{10} {}^{40}C_x \, {}^{60}C_{10-x} = {}^{100}C_{10}$

Probability (red = x, blue = y) for $x \in W$, $y \in W$

$$= \begin{cases} {}^{40}C_x \, {}^{60}C_y / {}^{100}C_{10} & x+y=10 \\ 0 & \text{otherwise} \end{cases}$$

I have not cut marks if you have not mentioned that x,y belongs to W (or that you have accidentally mentioned that they belong to Z but not mentioned that x>=0)

because then some will argue that writing 40Cx implies x is a non-negative integer, and some of you have written sentences like "picking x balls" implying x can only be non-negative.

In any case you MUST write x, y \in W for complete clarity.

But I have cut marks if you have not written that x+y=10