6. 9 Black 6 Red

Pick 1: B 9/15 R 6/15

10B 6R 9B 7R

pick 2: B 10/16 R 6/16 B 9/16 R 7/16

11B 6R 10B 7R 10B 7R 9B 8R

E[Black] = (9/15 × 10/16 × 11) + (9/15 × 6/16 × 10) +
(6/15 × 9/16 × 10) + (6/15 × 7/16 × 9)

E[Black] = 4.125 + 2.25 + 2.25 + 1.47

E[Black] = 10.10

E[Red] = (9/15 × 10/16 × 6) + (9/15 × 6/16 × 7) +
(6/15 × 9/16 × 7) + (6/15 × 7/16 × 8)

E[Red] = 2.25 + 1.575 + 1.575 + 1.3125

E[Red] = 6.7125

7. $E[x] = \sum_{x=1}^{n} x\ p(x)$ definition of expected value

$E[x] = \sum_{x=1}^{n} x\left(\frac{1}{n}\right)$ $p(x) = 1/n$, each value is equally likely to occur so the probability for any value occuring is $1/n$

$E[x] = \frac{1}{n} \sum_{x=1}^{n} x$ move constant out of summation

$E[x] = \frac{1}{n}\left(\frac{n(n+1)}{2}\right)$ substitute summation of x from n=1 to n

$E[x] = \frac{n+1}{2}$ simplify.