Solutions

2.1

- $3/6 = 1/2$ ✓.

2.2

- Outcomes with at least one head: HH, HT, TH – $1/3$ ✓.

2.3

- $0.5 \times 0.4 = 0.2$ ✓.

3.1

- Sum 5: (1,4),(2,3),(3,2),(4,1) – $4/36$; sum 7: $6/36$ ✓.
- Disjoint events add: $10/36$ ✓.
- At least one 6 by complement: $1 - 25/36 = 11/36$ ✓.
- Check: $1/6 + 1/6 - 1/36 = 6/36 + 6/36 - 1/36 = 11/36$ ✓ – inclusion-exclusion agrees.

3.2

- Branches: RR $\frac{3}{5} \cdot \frac{2}{4} = \frac{3}{10}$; RB and BR $\frac{3}{10}$ each; BB $\frac{1}{10}$ ✓.
- One of each: $\frac{3}{10} + \frac{3}{10} = \frac{3}{5}$ ✓.
- Bayes: $P(R_1 \mid R_2) = \frac{P(R_1 \cap R_2)}{P(R_2)} = \frac{3/10}{3/10+3/10} = \frac{1}{2}$ ✓.
- It differs from $3/5$ because a red second draw is evidence – the condition reshapes the sample space ✓.

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