Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

- $\dfrac{34}{80}$

$= \mathbf{0.425}$

2.2

- $\dfrac{1}{6} \times 300$

$= \mathbf{50}$

2.3

- 0.03×2000

$= \mathbf{60}$

2.4

- number of reds $= 0.35 \times 200 = \mathbf{70}$

2.5

- the probabilities add to 1: $x = 1 - 0.2 - 0.45 = \mathbf{0.35}$
- expected number of $B = 0.45 \times 60 = \mathbf{27}$

3.1

(a)

- each sector has probability $\dfrac{1}{5}$, so $\dfrac{1}{5} \times 400$

$= \mathbf{80}$

(b)

- $\dfrac{68}{400}$

$= \mathbf{0.17}$

(c)

- 0.17 is below the theoretical 0.2, so it landed on 3 less often than expected
- but 400 spins is not a large number of trials and this difference could easily be chance; more spins would give a more reliable answer, so there is not enough evidence to call it biased

3.2

(a)

- $\dfrac{215}{250}$

$= \mathbf{0.86}$

(b)

- 0.86×4000

$= \mathbf{3440}$

3.3

- **Ben's**, because he did many more trials
- estimate $= \dfrac{260}{500} = \mathbf{0.52}$

3.4

(a)

- the probabilities add to 1: $2x + x + 4 \times 0.1 = 1$, so $3x = 0.6$

$x = \mathbf{0.2}$

(b)

- P(6) $= 2 \times 0.2 = 0.4$, so the expected number $= 0.4 \times 250 = \mathbf{100}$

3.5

- expected wins $= 0.15 \times 200 = 30$, paying $30 \times 10 = \$300$
- cost of playing $= 200 \times 2 = \$400$
- $300 - 400 = -100$: an expected **loss of \$100**