## **EXERCISE 23B**

a

1 Find k in these probability distributions:

| x                 | 0   | 1 | 2   |  |
|-------------------|-----|---|-----|--|
| $\mathbf{P}(X=x)$ | 0.3 | k | 0.5 |  |

| Ь | x                 | 0 | 1  | 2  | 3 |
|---|-------------------|---|----|----|---|
|   | $\mathbf{P}(X=x)$ | k | 2k | 3k | k |

2 The probabilities of Jason scoring home runs in each game during his baseball career are given in the following table. X is the number of home runs per game.

| x    | 0 | 1      | 2      | 3      | 4      | 5      |
|------|---|--------|--------|--------|--------|--------|
| P(x) | a | 0.3333 | 0.1088 | 0.0084 | 0.0007 | 0.0000 |

- **a** State the value of P(2).
- **b** What is the value of *a*? Explain what this number means.
- What is the value of P(1) + P(2) + P(3) + P(4) + P(5)? Explain what this means.

P(X = x)

- **d** Draw a probability distribution spike graph of P(x) against x.
- **3** Explain why the following are not valid probability distribution functions:

| a | x    | 0   | 1   | 2   | 3   |  |
|---|------|-----|-----|-----|-----|--|
|   | P(x) | 0.2 | 0.3 | 0.4 | 0.2 |  |

| Ь | x    | 2   | 3   | 4   | 5    |
|---|------|-----|-----|-----|------|
|   | P(x) | 0.3 | 0.4 | 0.5 | -0.2 |

4 Sally's number of hits in each softball match has the following probability distribution:

| а | State | clearly | what | the | random | variable | represents. |
|---|-------|---------|------|-----|--------|----------|-------------|
|---|-------|---------|------|-----|--------|----------|-------------|

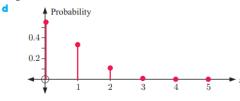
**b** Find k.

**c** Find: **i**  $P(X \ge 2)$  **ii**  $P(1 \le X \le 3)$ 

## Answers:

EXERCISE 23B

- **1 a** k = 0.2 **b**  $k = \frac{1}{7}$
- **2** a P(2) = 0.1088
  - **b** a = 0.5488 is the probability that Jason does not hit a home run in a game.
  - P(1) + P(2) + P(3) + P(4) + P(5) = 0.4512 and is the probability that Jason will hit one or more home runs in a game.



3 a  $\sum P(x_i) > 1$  b P(5) < 0 which is not possible

**a** X is the number of hits that Sally has in each match. X = 0, 1, 2, 3, 4, or 5

**b** 
$$k = 0.23$$

**c i**  $P(X \ge 2) = 0.79$  **ii**  $P(1 \le X \le 3) = 0.83$ 

| x | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
|   |   |   |   |   |   |   |

0.46

0.08

0.02

0.14

0.07