

EXERCISE 23B

- 1 Find k in these probability distributions:

a

x	0	1	2
$P(X = x)$	0.3	k	0.5

b

x	0	1	2	3
$P(X = x)$	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.
c What is the value of $P(1) + P(2) + P(3) + P(4) + P(5)$? Explain what this means.
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

b

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:

x	0	1	2	3	4	5
$P(X = x)$	0.07	0.14	k	0.46	0.08	0.02

- a** State clearly what the random variable represents.
b Find k .
c Find: **i** $P(X \geq 2)$ **ii** $P(1 \leq X \leq 3)$

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.
c $P(1) + P(2) + P(3) + P(4) + P(5) = 0.4512$ and is the probability that Jason will hit one or more home runs in a game.
d
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- 3 **a** $\sum P(x_i) > 1$ **b** $P(5) < 0$ which is not possible
- 4 **a** X is the number of hits that Sally has in each match.
 $X = 0, 1, 2, 3, 4, \text{ or } 5$
b $k = 0.23$
c **i** $P(X \geq 2) = 0.79$ **ii** $P(1 \leq X \leq 3) = 0.83$