



H26-test The General Addition Law: Test Pack

EDEXCEL 1ST0 · Calculator allowed · about 20 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 For each statement about the general addition law, write down whether it is True or False.

(i) The general addition law can be written as $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$. (1)

.....
(ii) If two events A and B are mutually exclusive, then $P(A \text{ and } B) = 1$. (1)

.....
(iii) For any two events A and B, $P(A \text{ or } B) = P(A) + P(B)$ always gives the correct probability. (1)

.....
(Total for Question 1 is 3 marks)

- 2** As part of a customer survey, a bakery asked 120 customers whether they bought bread and whether they bought milk that day. The two-way table shows the results.

	Milk	No milk	Total
Bread	42	18	60
No bread	24	36	60
Total	66	54	120

A customer is chosen at random from the 120 surveyed. Let event A be "the customer bought bread" and event B be "the customer bought milk".

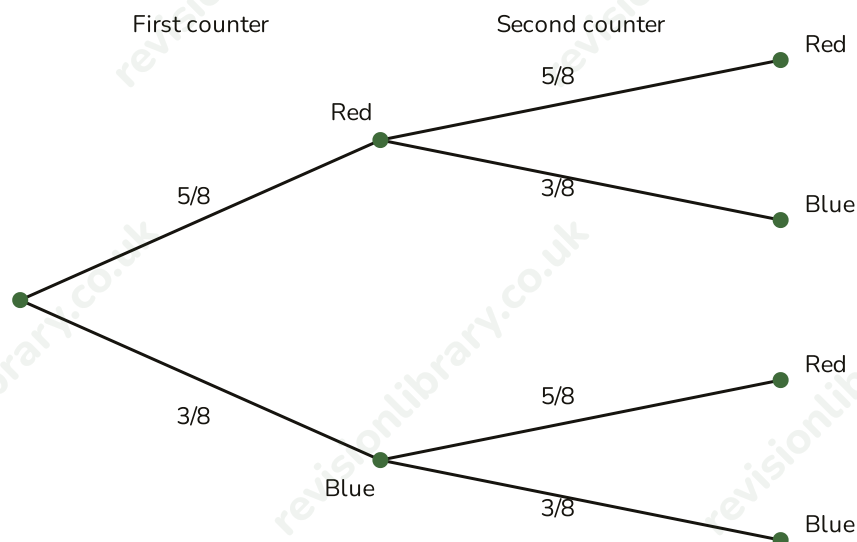
- (a) Write down $P(A \text{ and } B)$. (1)

- (b) Write down $P(A)$ and $P(B)$. (2)

- (c) Use the general addition law to find $P(A \text{ or } B)$, then confirm your answer by working directly from the table. (2)

(Total for Question 2 is 5 marks)

- 3** A bag contains 5 red counters and 3 blue counters. Sofia takes a counter at random, replaces it, then takes a second counter at random. The tree diagram shows the probabilities for the two draws. Event A: the first counter is red. Event B: the second counter is red.



- (a) Use the tree diagram to find $P(A \text{ and } B)$, the probability that both counters are red. (2)
- (b) Given that $P(A) = P(B) = 5/8$, use the general addition law to find $P(A \text{ or } B)$. (2)
- (c) Hence find $P(\text{neither counter is red})$. (1)

(Total for Question 3 is 5 marks)

4 For two events A and B, $P(A) = x$, $P(B) = x + 0.1$, $P(A \text{ and } B) = 0.05$ and $P(A \text{ or } B) = 0.65$.

(a) Form an equation in x using the general addition law. (1)

(b) Solve your equation to find the value of x . (2)

(c) Hence write down $P(A)$ and $P(B)$. (2)

(Total for Question 4 is 5 marks)

Mark scheme · H26-test The General Addition Law: Test Pack

Question 1

- (i) **B1** True cao
- (i) **Answer: True**
- (ii) **B1** False cao
- (ii) **Answer: False**
- (iii) **B1** False cao
- (iii) **Answer: False**

Question 2

- (a) **B1** $42/120$ oe cao
- (a) **Answer: $7/20$**
- (b) **B1** $P(A) = 60/120$ oe cao
- (b) **B1** $P(B) = 66/120$ oe cao
- (b) **Answer: $P(A) = 1/2, P(B) = 11/20$**
- (c) **M1** $1/2 + 11/20 - 7/20$, oe
- (c) **A1** $7/10$ oe cao, confirmed by $(120 - 36)/120 = 84/120 = 7/10$ from the table
- (c) **Answer: $7/10$**

Question 3

- (a) **M1** $5/8 \times 5/8$, oe
- (a) **A1** $25/64$ cao
- (a) **Answer: $25/64$**
- (b) **M1** $5/8 + 5/8 - 25/64$, oe $(40/64 + 40/64 - 25/64)$
- (b) **A1** $55/64$ cao
- (b) **Answer: $55/64$**
- (c) **B1** $9/64$, ft as 1 - their (b), oe
- (c) **Answer: $9/64$**

Question 4

- (a) **B1** $x + (x + 0.1) - 0.05 = 0.65$, oe
- (a) **Answer: $x + (x + 0.1) - 0.05 = 0.65$**
- (b) **M1** $2x + 0.05 = 0.65$, oe
- (b) **A1** $x = 0.3$ cao
- (b) **Answer: $x = 0.3$**
- (c) **B1** $P(A) = 0.3$ cao
- (c) **B1** $P(B) = 0.4$ cao
- (c) **Answer: $P(A) = 0.3, P(B) = 0.4$**