

8. The results of a traffic survey of colour and type of car are given in the table shown.

One car is selected at random from this group.

Find the probability that the car selected is

- (i) a green estate car
- (ii) a saloon car
- (iii) a black car or an estate car.

	Saloon	Estate	
White	68	62	130
Green	26	32	58
Black	6	6	12
	100	100	200

$$(i) \quad P(G \cap E) = \frac{32}{200} = \frac{4}{25}$$

$$(ii) \quad P(S) = \frac{100}{200} = \frac{1}{2}$$

$$(iii) \quad P(B \cup E) = \frac{106}{200} = \frac{53}{100}$$

General Addition Rule

$$P(B \cup E) = P(B) + P(E) - P(B \cap E)$$

$$= \frac{12}{200} + \frac{100}{200} - \frac{6}{200} = \frac{53}{100}$$

9. In a fairground game, players each choose a number on this board.

An electronic device lights up and turns off the numbers in a random way. When it stops, one number is lit up.

What is the probability that the lit-up number is

- (i) in the first row $\frac{1}{4}$
- (ii) in the first column $\frac{1}{4}$
- (iii) either in the first row or the first column $\frac{7}{16}$
- (iv) on the edge of the board $\frac{12}{16} = \frac{3}{4}$
- (v) on the diagonal from top left to bottom right $\frac{1}{4}$
- (vi) either on the edge or on the diagonal from top left to bottom right $\frac{14}{16} = \frac{7}{8}$
- (vii) either a square number or an odd number? $\frac{10}{16} = \frac{5}{8}$

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

10. A bag contained 8 red, 12 blue and an unknown number of green beads. In a random draw, the probability of drawing a green bead was $\frac{1}{5}$. How many green beads were in the bag at the start?

8 Red
12 blue
? green

Red + Blue = 20

If $\frac{1}{5}$ are green
 $\Rightarrow \frac{4}{5}$ are Red or Blue

20	$\frac{4}{5}$
$\div 4$ 5	$\frac{1}{5}$ $\div 4$

\Rightarrow 5 green beads

13. These cards are turned over and shuffled. A card is picked at random.



The event A is 'The number picked is less than 24'.
 The event B is 'The number picked is a multiple of 5'.
 The event C is 'The number picked is prime'.
 The event D is 'The number picked is a multiple of 3'.

- (i) Are these pairs of events mutually exclusive?
 (a) A, B **X** (b) A, C **X** (c) A, D **X** (d) B, C **✓** (e) B, D **✓**
- (ii) What is the probability that the number picked is either prime or a multiple of 3?
- (iii) Jeff said:
 'The probability of picking a number less than 24 is $\frac{4}{10}$.
 The probability of picking an even number is $\frac{5}{10}$.
 So the probability of picking either a number less than 24 or an even number is $\frac{9}{10}$.
 Is he right? If not, why not?

Mutually Exclusive \Rightarrow they can't happen together

$P(C \cup D) = \frac{5}{10} = \frac{1}{2}$

General Addition Rule

$P(A \cup \text{Even}) = P(A) + P(\text{Even}) - P(A \cap \text{Even})$

$= \frac{4}{10} + \frac{5}{10} - \frac{2}{10}$

$= \frac{7}{10}$

\Rightarrow He's wrong