# Conditional Probability: Two-Way Tables

ANSWERS

**1**

The table shows 70 people at an adventure park. One person is picked at random. Given that the person is a child, find the probability that they went on the zip wire.

| | Climbing | Zip wire | Total |
|---|---|---|---|
| Adult | 18 | 12 | 30 |
| Child | 25 | 15 | 40 |
| Total | 43 | 27 | 70 |

P = 15 (the ones you want) / 40 (the given group)

Answer $\frac{3}{8}$

**2**

The table shows 80 drinks sold at a sandwich bar. One drink is picked at random. Given that it was sold in the morning, find the probability that it is a coffee.

| | Tea | Coffee | Juice | Total |
|---|---|---|---|---|
| Morning | 9 | 14 | 7 | 30 |
| Afternoon | 16 | 26 | 8 | 50 |
| Total | 25 | 40 | 15 | 80 |

P = 14 (the ones you want) / 30 (the given group)

Answer $\frac{7}{15}$

**3**

The table shows 90 runners in a fun run. One runner is picked at random. Given that the runner won a medal, find the probability that they are under 16.

| | Medal | No medal | Total |
|---|---|---|---|
| Under 16 | 18 | 30 | 48 |
| 16 and over | 22 | 20 | 42 |
| Total | 40 | 50 | 90 |

P = 18 (the ones you want) / 40 (the given group)

Answer $\frac{9}{20}$

**4**

The table shows the favourite season of 100 students. One student is picked at random. Given that the student chose winter, find the probability that they are in Year 8.

| | Summer | Winter | Total |
|---|---|---|---|
| Year 7 | 20 | 12 | 32 |
| Year 8 | 18 | 15 | 33 |
| Year 9 | 25 | 10 | 35 |
| Total | 63 | 37 | 100 |

P = 15 (the ones you want) / 37 (the given group)

Answer $\frac{15}{37}$

**5**

The table shows 120 cars at a garage. Complete the table. One car is picked at random. Given that the car is grey, find the probability that it is electric.

| | Blue | Grey | Total |
|---|---|---|---|
| Electric | 16 | 24 | 40 |
| Petrol | 38 | 42 | 80 |
| Total | 54 | 66 | 120 |

40 − 16 = 24, 24 + 42 = 66, so $\frac{24}{66}$

Answer $\frac{4}{11}$

**6**

The table shows the gallery 60 museum visitors chose. One visitor is picked at random. Does knowing the visitor is a child make the dinosaur gallery more likely? Show how you know.

| | Dinosaurs | Space | Total |
|---|---|---|---|
| Adult | 18 | 22 | 40 |
| Child | 15 | 5 | 20 |
| Total | 33 | 27 | 60 |

$\frac{33}{60} = \frac{11}{20}$, given a child $\frac{15}{20}$

Answer Yes

**7**

The table shows the instrument 50 students learn. One student is picked at random.

(a) Given that the student is in Year 11, find the probability that they learn the guitar.

(b) Given that the student learns the guitar, find the probability that they are in Year 11.

| | Piano | Guitar | Total |
|---|---|---|---|
| Year 10 | 12 | 8 | 20 |
| Year 11 | 9 | 21 | 30 |
| Total | 21 | 29 | 50 |

(a) $\frac{7}{10}$

(b) $\frac{21}{29}$

**8**

The table shows 85 journeys to school. One journey is picked at random. Given that it was late, Amara says the probability it was by bus is $\frac{12}{85}$. Explain Amara's mistake. Then find the probability.

| | On time | Late | Total |
|---|---|---|---|
| Bus | 33 | 12 | 45 |
| Car | 32 | 8 | 40 |
| Total | 65 | 20 | 85 |

85 is everyone, not just the late journeys out of the 20 late journeys

Answer $\frac{3}{5}$

# Conditional Probability: Two-Way Tables *further practice*

ANSWERS

**9**

The table shows the first ride of 75 people at a theme park. One person is picked at random. Given that the person is an adult, find the probability that they chose the coaster.

| | Coaster | Log flume | Teacups | Total |
|---|---|---|---|---|
| Adult | 16 | 10 | 6 | 32 |
| Child | 14 | 18 | 11 | 43 |
| Total | 30 | 28 | 17 | 75 |

out of the 32 adults: $\frac{16}{32}$

Answer $\frac{1}{2}$

**10**

90 students chose art or music.
One student is picked at random.
Given that the student chose art, find the probability that they are in Year 9.

| | Art | Music | Total |
|---|---|---|---|
| Year 7 | 12 | 18 | 30 |
| Year 8 | 15 | 13 | 28 |
| Year 9 | 9 | 23 | 32 |
| Total | 36 | 54 | 90 |

out of the 36 who chose art: $\frac{9}{36}$

Answer $\frac{1}{4}$

**11**

A bakery sold 100 cakes. Complete the table. One cake is picked at random. Given that it was sold in the afternoon, find the probability that it is lemon.

| | Lemon | Carrot | Chocolate | Total |
|---|---|---|---|---|
| Morning | 14 | 9 | 17 | 40 |
| Afternoon | 18 | 12 | 30 | 60 |
| Total | 32 | 21 | 47 | 100 |

100 − 40 = 60, 60 − 12 − 30 = 18

Answer $\frac{3}{10}$

**12**

The table shows 80 guests at a hotel.
One guest is picked at random.
Find P(breakfast | business).
The line | means given.

| | Breakfast | No breakfast | Total |
|---|---|---|---|
| Business | 18 | 6 | 24 |
| Holiday | 20 | 36 | 56 |
| Total | 38 | 42 | 80 |

out of the 24 business guests: $\frac{18}{24}$

Answer $\frac{3}{4}$

**13**

120 people watched a film. 70 watched it in 3D and the rest in 2D. 28 of the 3D viewers and 15 of the 2D viewers bought popcorn. Complete the table. One person is picked at random. Given that they bought popcorn, find the probability that they watched in 2D.

| | Popcorn | No popcorn | Total |
|---|---|---|---|
| 3D | 28 | 42 | 70 |
| 2D | 15 | 35 | 50 |
| Total | 43 | 77 | 120 |

28 + 15 = 43 bought popcorn: $\frac{15}{43}$

Answer $\frac{15}{43}$

**14**

The table shows how 100 students get to school. More Year 11 students cycle. Is a Year 10 or a Year 11 student more likely to cycle? Show how you know.

| | Cycle | Other | Total |
|---|---|---|---|
| Year 10 | 12 | 28 | 40 |
| Year 11 | 15 | 45 | 60 |
| Total | 27 | 73 | 100 |

$\frac{12}{40} = \frac{3}{10}$ and $\frac{15}{60} = \frac{1}{4}$

Answer Year 10

**15**

The table shows 70 dogs at a show.
Given that a dog is a puppy, the probability that it has long hair is $\frac{3}{8}$.
Complete the table. Given that a dog has long hair, find the probability that it is a puppy.

| | Long hair | Short hair | Total |
|---|---|---|---|
| Puppy | 9 | 15 | 24 |
| Adult | 20 | 26 | 46 |
| Total | 29 | 41 | 70 |

$\frac{3}{8}$ of 24 = 9, then 9 out of 29

Answer $\frac{9}{29}$

**16**

The table shows whether 40 students are left-handed or right-handed.
Tomasz says: "A girl is just as likely to be left-handed as a left-handed student is to be a girl." Is Tomasz right?
Show how you know.

| | Left | Right | Total |
|---|---|---|---|
| Girl | 4 | 16 | 20 |
| Boy | 6 | 14 | 20 |
| Total | 10 | 30 | 40 |

$\frac{4}{20} = \frac{1}{5}$ but $\frac{4}{10} = \frac{2}{5}$

Answer No