The AND and OR Rules

ANSWERS

1

A fair coin is flipped and a fair spinner numbered 1 to 5 is spun. Complete the grid.
Find P(a tail and a 3).

	1	2	3	4	5
H	H1	H2	H3	H4	H5
T	T1	T2	(T3)	T4	T5

P(tail) = $\frac{1}{2}$ P(3) = $\frac{1}{5}$

$\frac{1}{2} \times \frac{1}{5} = \frac{1}{10}$

check: 1 out of 10

and: multiply

Answer $\frac{1}{10}$

2

A bag holds 3 pink, 2 white and 4 grey counters. One is taken at random.
Find P(pink or grey).

(P) (P) (P) (W) (W)
(G) (G) (G) (G)

P(pink) = $\frac{3}{9}$ P(grey) = $\frac{4}{9}$

$\frac{3}{9} + \frac{4}{9} = \frac{7}{9}$

check: 7 out of 9

or: add

Answer $\frac{7}{9}$

3

The probability that Ana's train is late is $\frac{1}{3}$.
The probability that it snows is $\frac{1}{4}$.
The two are independent.
Find the probability that the train is late and it snows.

$\frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$

and: multiply or: add

Answer $\frac{1}{12}$

4

A biased spinner lands on A, B, C or D.
The table shows the probabilities.
Find P(A or C).

Letter	A	B	C	D
Probability	0.12	0.4	0.3	0.18

0.12 + 0.3 = 0.42

and: multiply or: add

0.42

Answer

5

A bag holds 2 pink and 3 grey counters.
Zoe takes a counter and puts it back.
Then she takes another. Find the probability that both counters are the same colour.

(P) (P) (G) (G) (G)

pink, pink $\frac{2}{5} \times \frac{2}{5} = \frac{4}{25}$

grey, grey $\frac{3}{5} \times \frac{3}{5} = \frac{9}{25}$

or: add $\frac{4}{25} + \frac{9}{25} = \frac{13}{25}$

Answer $\frac{13}{25}$

6

A spinner lands on red, blue or green.
(a) It is spun once. Find P(red or green).
(b) It is spun twice. Find P(blue both times).

Colour	Red	Blue	Green
Probability	$\frac{1}{5}$	$\frac{3}{5}$	$\frac{1}{5}$

$\frac{1}{5} + \frac{1}{5}$

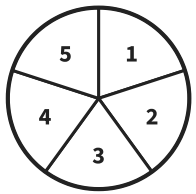
$\frac{3}{5} \times \frac{3}{5}$

(a) $\frac{2}{5}$

(b) $\frac{9}{25}$

7

Lily rolls a fair dice and spins this fair spinner. Find the probability of a 6 on the dice and an odd number on the spinner.



$\frac{1}{6} \times \frac{3}{5}$

$\frac{3}{30} = \frac{1}{10}$

Answer

8

Two fair coins are flipped.
Tom says P(two heads) = $\frac{1}{2} + \frac{1}{2} = 1$.
Explain Tom's mistake.
Then find P(two heads).

he added, but and means multiply

a total of 1 would mean certain

Answer $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

The AND and OR Rules *further practice*

ANSWERS

9

The probability that a football team wins on Saturday is $\frac{2}{3}$. The probability that it snows on Saturday is $\frac{1}{10}$.
The two are independent.
Find the probability that the team wins and it snows.

$\frac{2}{3} \times \frac{1}{10}$

Answer $\frac{2}{30} = \frac{1}{15}$

10

One of these cards is picked at random.
Find the probability that it shows an E or a G.

G	R	E	E	N	H	O	U	S	E

$\frac{3}{10} + \frac{1}{10}$

Answer $\frac{4}{10} = \frac{2}{5}$

11

Each day Kai walks to school, gets a lift or cycles. P(walks) = $\frac{1}{2}$ and P(gets a lift) = $\frac{1}{3}$. Find the probability that he walks or gets a lift.

$\frac{3}{6} + \frac{2}{6}$

Answer $\frac{5}{6}$

12

The probability that Femi's bus is late is $\frac{1}{5}$ each day, independently.
Find the probability that it is late on Monday and not late on Tuesday.

$\frac{1}{5} \times \frac{4}{5}$

Answer $\frac{4}{25}$

13

A spinner lands on red with probability $\frac{1}{3}$ and on blue with probability $\frac{2}{3}$.
It is spun twice. Find the probability that it lands on the same colour both times.

$\frac{1}{9} + \frac{4}{9}$

Answer $\frac{5}{9}$

14

Which is more likely: rolling a 5 or a 6 with one fair dice, or getting two heads when two fair coins are flipped?
Show how you know.

$\frac{2}{6} = \frac{1}{3}$ is more than $\frac{1}{4}$

Answer the dice

15

The probability that Omar's train is on time is $\frac{4}{5}$. Getting a seat is independent of the train being on time.
The probability that the train is on time and he gets a seat is $\frac{8}{15}$.
Find the probability that he gets a seat.

$\frac{4}{5} \times ? = \frac{8}{15}$

Answer $\frac{2}{3}$

16

Two fair dice are rolled. Sara says getting two sixes is just as likely as getting a 1 and a 2, in either order. Is Sara right? Explain.

	1	2	3	4	5	6
1		✓				
2	✓					
3						
4						
5						
6						✓

1 then 2, or 2 then 1: two outcomes

Answer No: $\frac{1}{36}$ and $\frac{2}{36}$