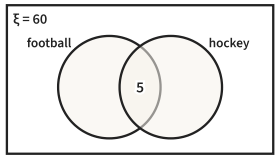
Fractions and Venn diagrams

ANSWERS

1

60 students were asked about sport. $\frac{1}{3}$ play football and $\frac{1}{4}$ play hockey. 5 play both. How many play neither?



football $\frac{1}{3}$ of 60 = 20

hockey $\frac{1}{4}$ of 60 = 15

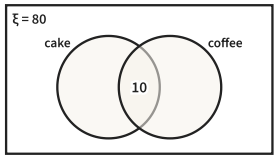
Neither 60 − 30 = 30

30

Answer _____

2

80 people visited a café. $\frac{3}{8}$ ordered cake and $\frac{2}{5}$ ordered coffee. 10 ordered both. How many ordered neither?



cake $\frac{3}{8}$ of 80 = 30

coffee $\frac{2}{5}$ of 80 = 32

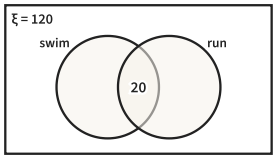
Neither 80 − 52 = 28

28

Answer _____

3

A club has 120 members. $\frac{2}{3}$ swim and $\frac{3}{10}$ run. 20 members do both. How many do neither?



swim $\frac{2}{3}$ of 120 = 80

run $\frac{3}{10}$ of 120 = 36

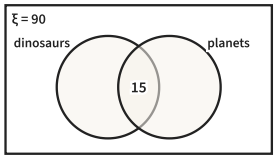
Neither 120 − 96 = 24

24

Answer _____

4

90 visitors went to a science centre. $\frac{4}{9}$ saw the dinosaurs and $\frac{1}{3}$ saw the planets. 15 saw both. How many saw neither?



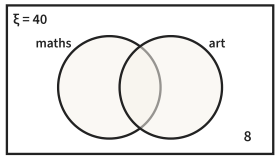
Neither 90 − 55 = 35

35

Answer _____

5

In a class of 40, $\frac{3}{4}$ like maths and $\frac{1}{2}$ like art. 8 like neither. A pupil is picked at random. Find the probability that they like both.

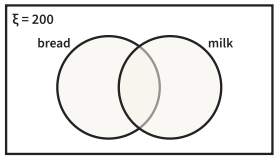


30 + 20 = 50, but only 32 like one or both, so 18 like both

Answer $\frac{9}{20}$

6

200 shoppers were asked what they bought. 45% bought bread and $\frac{1}{4}$ bought milk. $\frac{1}{5}$ of the bread buyers also bought milk. How many bought neither?



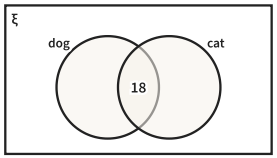
90 bread, 50 milk, 18 both: 200 − 122

78

Answer _____

7

$\frac{3}{5}$ of a group of people have a dog. $\frac{1}{4}$ of the dog owners also have a cat. 18 people have a dog and a cat. How many people are in the group?



18 is a quarter of 72 dog owners; 72 is three fifths of 120

120

Answer _____

8

Of 150 people, $\frac{2}{5}$ speak French, $\frac{1}{3}$ speak Spanish and $\frac{1}{10}$ speak both. A person is picked at random. Find the probability that they speak only one of the two languages.

45 French only and 35 Spanish only, 80 out of 150

Answer $\frac{8}{15}$

Fractions and Venn diagrams *further practice*

ANSWERS

9

48 children were asked what they ride. $\frac{5}{8}$ have a bike and $\frac{1}{3}$ have a scooter. 6 have both. How many have neither?

30 + 16 − 6 = 40 have one or both

Answer 8

10

A gardener grew 100 plants. $\frac{7}{20}$ are tall and $\frac{2}{5}$ have red flowers. $\frac{1}{5}$ of the tall plants have red flowers.
How many plants are neither tall nor red?

35 tall, 40 red, 7 both: 100 − 68

Answer 32

11

60 guests ate at a wedding. $\frac{1}{2}$ had soup and $\frac{2}{5}$ had a dessert. 9 had both.
A guest is picked at random.
Find the probability that they had soup but no dessert.

30 had soup, 9 of them also had dessert, 21 out of 60

Answer $\frac{7}{20}$

12

160 people were asked how they get the news. $\frac{3}{8}$ read a newspaper, $\frac{5}{8}$ read news online and $\frac{1}{4}$ do neither.
How many do both?

60 + 100 = 160, but only 120 do one or both

Answer 40

13

A company has 300 workers. 40% drive to work and $\frac{1}{6}$ cycle. $\frac{1}{10}$ of the drivers also cycle on some days. A worker is picked at random. Find the probability that they neither drive nor cycle.

120 + 50 − 12 = 158, so 142 out of 300

Answer $\frac{71}{150}$

14

A Venn diagram shows 72 people. $\frac{1}{3}$ of them are in A only, $\frac{1}{4}$ are in B only and $\frac{1}{6}$ are in neither. How many are in both A and B?

24 + 18 + 12 = 54, and 72 − 54 = 18

Answer 18

15

A class has 30 students. $\frac{2}{3}$ play an instrument. $\frac{3}{4}$ of those who play an instrument also sing, and $\frac{1}{2}$ of the others sing. How many students sing?

20 play, 15 of them sing; 10 do not, 5 of them sing

Answer 20

16

In a group of 40, $\frac{1}{2}$ like tea and $\frac{3}{8}$ like coffee. 6 like both.
Amir says $\frac{1}{2} + \frac{3}{8} = \frac{7}{8}$ like tea or coffee, so 5 like neither. Explain his mistake and find how many like neither.

the 6 who like both are counted twice: 20 + 15 − 6 = 29, 40 − 29 = 11

Answer 11