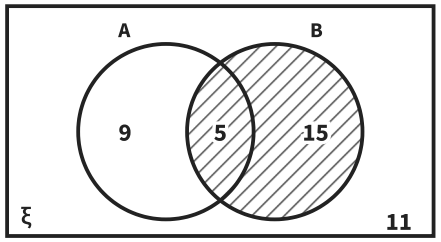
Conditional Probability: Venn Diagrams

ANSWERS

1

The Venn diagram shows the number in each region. One is picked at random. The given circle, B, is shaded. Find P(A | B).

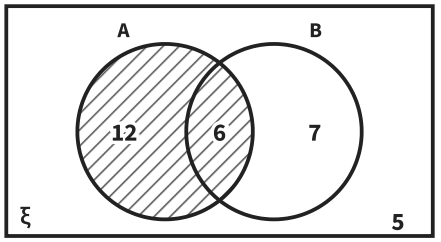


$P(A \mid B) = \frac{5}{20}$ (5: the overlap; 20: all of B)

Answer $\frac{5}{20} = \frac{1}{4}$

2

The Venn diagram shows the number in each region. One is picked at random. The given circle, A, is shaded. Find P(B | A).

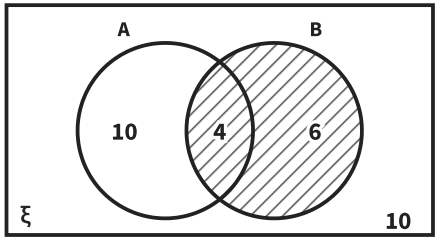


$P(B \mid A) = \frac{6}{18}$ (6: the overlap; 18: all of A)

Answer $\frac{6}{18} = \frac{1}{3}$

3

The Venn diagram shows the number in each region. One is picked at random. Shade the given circle. Find P(A | B).

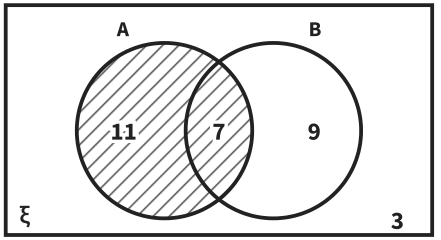


$P(A \mid B) = \frac{4}{10}$ (4: the overlap; 10: all of B)

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

4

The Venn diagram shows the number in each region. One is picked at random. Shade the given circle. Find P(B | A).

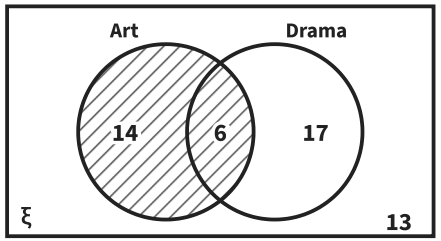


$P(B \mid A) = \frac{7}{18}$ (7: the overlap; 18: all of A)

Answer $\frac{7}{18}$

5

The Venn diagram shows 50 students and the clubs they go to. A student is chosen at random. Given that the student goes to art, find the probability that they also go to drama.

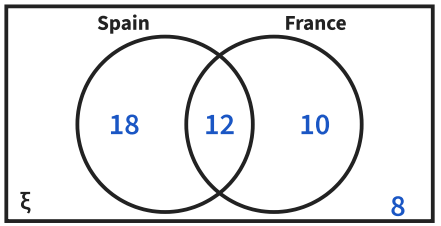


6 + 14 = 20 go to art

Answer $\frac{6}{20} = \frac{3}{10}$

6

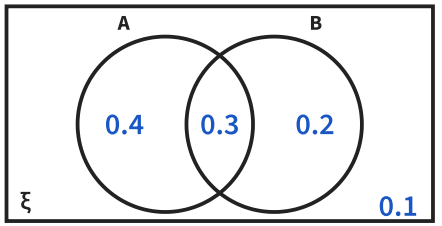
48 people were asked where they have been on holiday. 30 have been to Spain, 22 to France and 12 to both. Complete the Venn diagram. Given that a person has been to France, find the probability that they have also been to Spain.



Answer $\frac{12}{22} = \frac{6}{11}$

7

P(A) = 0.7, P(B) = 0.5 and P(A ∩ B) = 0.3. Write the probabilities in the Venn diagram. Find P(A | B).



$\frac{0.3}{0.5} = \frac{3}{5}$

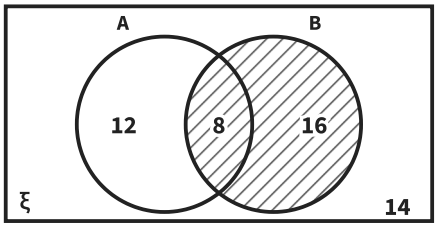
Answer $\frac{3}{5}$

8

Jamal says $P(A \mid B) = \frac{8}{50}$.

Explain Jamal's mistake.

Then find P(A | B).



50 is the whole box, not all of B

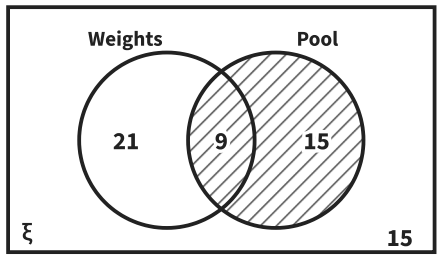
Answer $\frac{8}{24} = \frac{1}{3}$

Conditional Probability: Venn Diagrams *further practice*

ANSWERS

9

The Venn diagram shows what 60 members of a gym use. A member is chosen at random. Given that the member uses the pool, find the probability that they also use the weights.

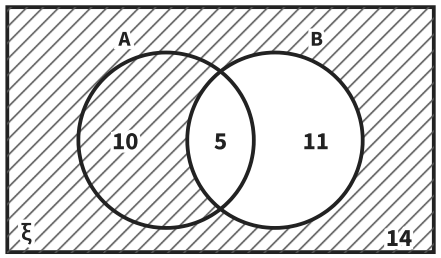


9 out of 9 + 15 = 24

Answer $\frac{9}{24} = \frac{3}{8}$

10

The Venn diagram shows the number in each region. One is picked at random. Find P(A | B′).

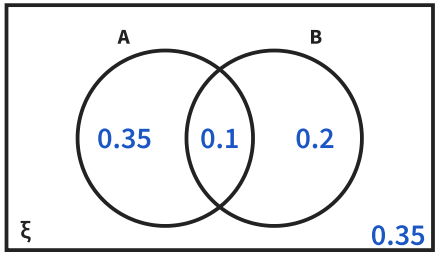


B′ is 10 + 14 = 24, 10 of them in A

Answer $\frac{10}{24} = \frac{5}{12}$

11

P(A) = 0.45, P(B) = 0.3 and P(A ∩ B) = 0.1. Find P(B | A).

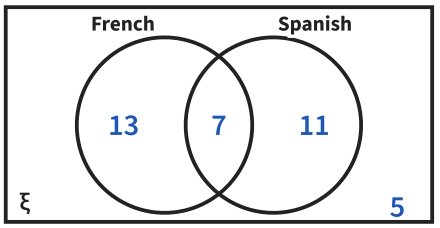


$\frac{0.1}{0.45} = \frac{10}{45}$

Answer $\frac{2}{9}$

12

36 students: 20 study French, 18 study Spanish and 5 study neither. A student is chosen at random. Given that the student studies French, find the probability that they also study Spanish.

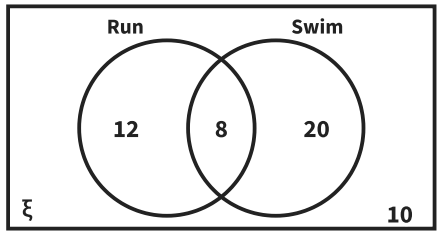


36 − 5 = 31 inside, 38 − 31 = 7 both

Answer $\frac{7}{20}$

13

The Venn diagram shows 50 people. Which is more likely: a runner who also swims, or a swimmer who also runs? Show how you know.

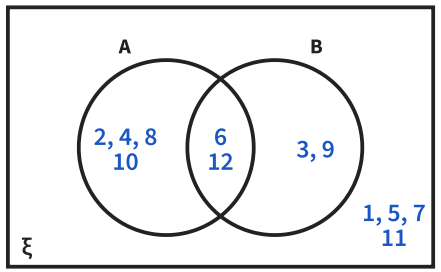


$\frac{8}{20}$ *is more than* $\frac{8}{28}$

Answer *a runner who swims*

14

ξ = whole numbers from 1 to 12.
A = even numbers. B = multiples of 3.
Write each number in the Venn diagram.
A number is picked at random.
Find P(A | B).

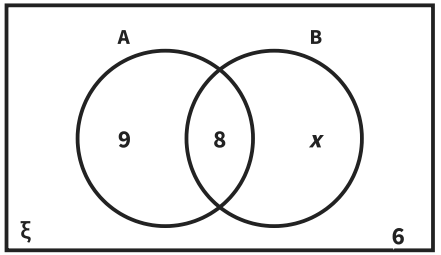


B = {3, 6, 9, 12}, 6 and 12 are even

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

15

One is picked at random. P(A | B) = $\frac{2}{5}$.
Find *x*.



8 is $\frac{2}{5}$ *of 20, so 20 − 8 = 12*

Answer *x = 12*

16

Mia says P(A | B) can never be equal to P(B | A). Is Mia right? Explain.

5, 3, 5 in the circles: $\frac{3}{8}$ *both ways*

Answer *No*