

Question 1

In a group of people:

6 speak both German and French

10 speak German but not French

22 speak exactly one of those languages

3 speak neither language

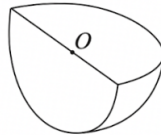
Given that a randomly chosen person speaks French,
find the probability that they also speak German.

Question 2

Here is a quarter of a solid sphere, with centre O .

The volume of the solid is $9\pi \text{ cm}^3$

Find the surface area of the solid in
terms of π .



$$\text{Volume of sphere} = \frac{4}{3} \pi r^3$$

$$\text{Surface area of sphere} = 4\pi r^2$$

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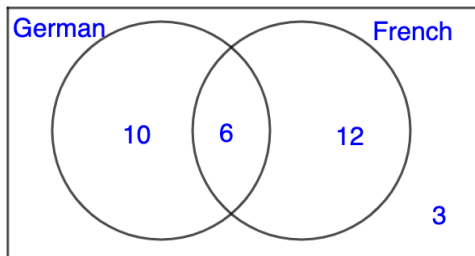
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Given that a randomly chosen person speaks French,
find the probability that they also speak German.



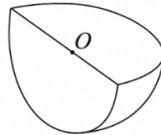
The probability is $\frac{6}{18}$

Question 2

Here is a quarter of a solid sphere, with centre O .

The volume of the solid is $9\pi \text{ cm}^3$

Find the surface area of the solid in terms of π .



$$\text{Volume of sphere} = \frac{4}{3}\pi r^3$$

$$\text{Surface area of sphere} = 4\pi r^2$$

$$\text{Volume of whole sphere} = \frac{4}{3}\pi r^3 = 4 \times 9\pi$$

$$\text{So } r = \sqrt[3]{3 \times 9} = 3 \text{ cm}$$

$$\text{Curved surface area} = \frac{4\pi r^2}{4} = \frac{4 \times \pi \times 3^2}{4} = 9\pi$$

$$\text{Flat surface area} = \pi r^2 = \pi \times 3^2 = 9\pi$$

$$\therefore \text{Total surface area} = 18\pi \text{ cm}^2$$