

Customers at an ice-cream shop can have toppings and/or sauce on their ice-cream cone.

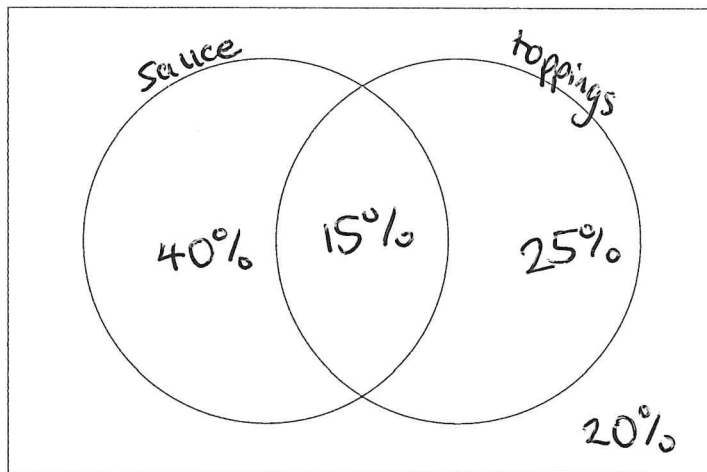
No frequencies

so think %

Q1

- Two-fifths of the customers take sauce only. 40%
- 15% of the customers take sauce and toppings.
- One in five customers do not take sauce or toppings. 20%

(a) Complete the Venn diagram below to illustrate this information.



[2]

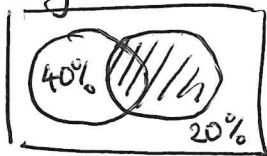
(b) Find the probability that a customer, selected at random, takes toppings or sauce, but not both, on their ice-cream cone.

$$40\% + 25\%$$

Answer 65% 0.65 [2]

(c) Given that a customer, selected at random, does not take a topping on their ice-cream cone, what is the probability that they do not take sauce either?

only look at outside the toppings circle



20% out of 60%

$$\frac{20}{60}$$

Answer 1/3 [2]

(d) During one Sunday, 80 ice-cream cones are sold.

(i) How many of these would you expect to be with sauce or toppings or both?

80% of 80 ice-creams

Ans 64 ice-creams

Venn Diagrams

Q2

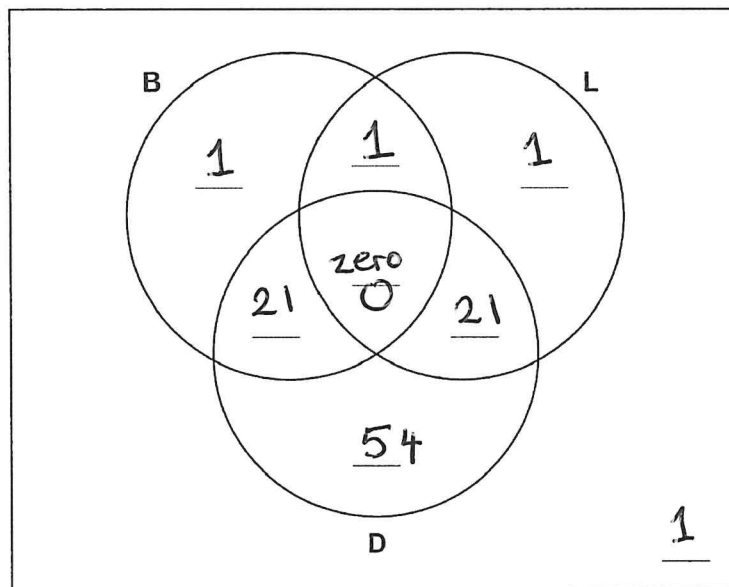
100 people

were asked whether they had hot food at breakfast (B), lunch (L) or dinner (D) yesterday.

- 54 **only** had hot food for dinner
- 1 person didn't have hot food for any meal
- no-one had hot food for all three meals
- a **total** of 4 people didn't have hot food for dinner
- the number of people who had hot breakfast **and** hot dinner is equal to the number of people who had hot lunch **and** hot dinner.

Complete the Venn diagram with a possible set of correct values.

[5 marks]



4 outside the Dinner circle. I choose 1, 1, 1  
but other possibilities

$$54 + 4 = 58$$

$$100 - 58 = 42$$

Check they add up to 100

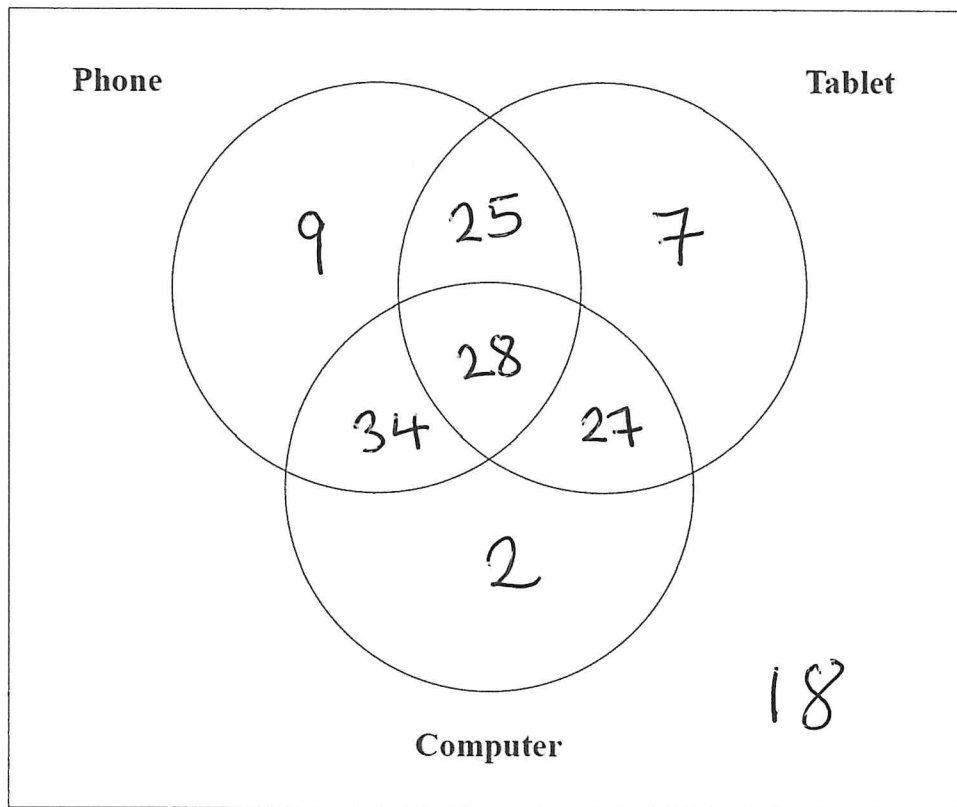
A group of 150 people were surveyed about electronic devices they owned.

The results were as follows:

**Q3**

- 96 people owned a phone, *96 inside the phone circle*
- 87 people owned a tablet,
- 91 people owned a computer,
- 53 people owned a phone and a tablet,
- 62 people owned a phone and a computer,
- 55 people owned a tablet and a computer,
- 28 people owned all three devices *Do this first*

(a) Complete the Venn diagram below.



[4]

(b) How many people did not own a phone or a computer?

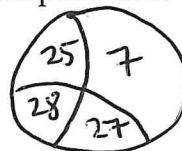
$$7 + 18$$

*Ans 25*

One person who owned a tablet was chosen at random.

(d) Find the probability that they owned a computer too.

*Look only at the tablet circle/set.*

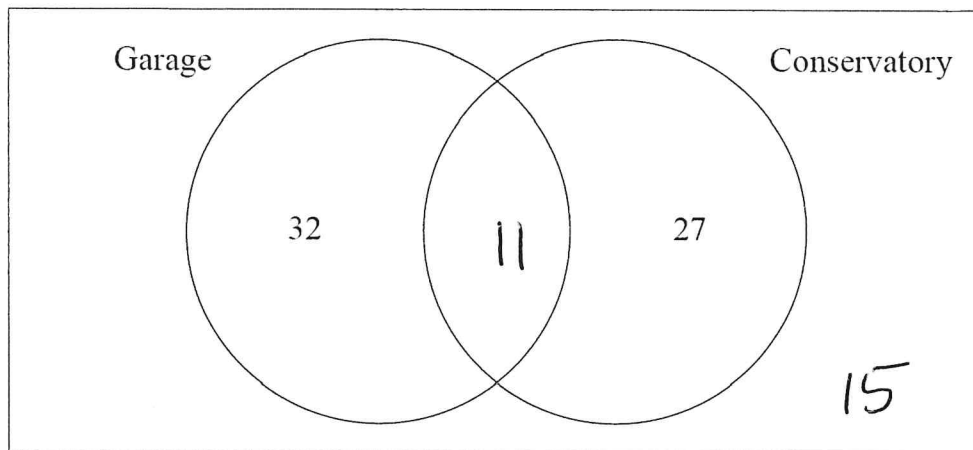


$$\frac{55}{28+27+25+7} = \frac{55}{87}$$

An estate agent studied 85 properties to investigate how many had a garage and how many had a conservatory.

**Q4** The study showed that 11 properties had both a garage and a conservatory.

(a) Use the information provided to complete the Venn diagram below.



[2]

$$85 - 32 - 11 - 27 = 15$$

(b) One property is chosen at random from the study.

Find the probability that this property:

(i) has a garage but not a conservatory;

32 out of 85

Answer  $\frac{32}{85}$  [1]

(ii) does not have a garage.

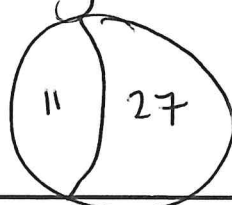
no garage 27 + 15

Answer  $\frac{42}{85}$  [2]

One property which has a conservatory is chosen at random from the study.

(c) Find the probability that this property also has a garage.

Look only at the conservatory set



11 out of 38

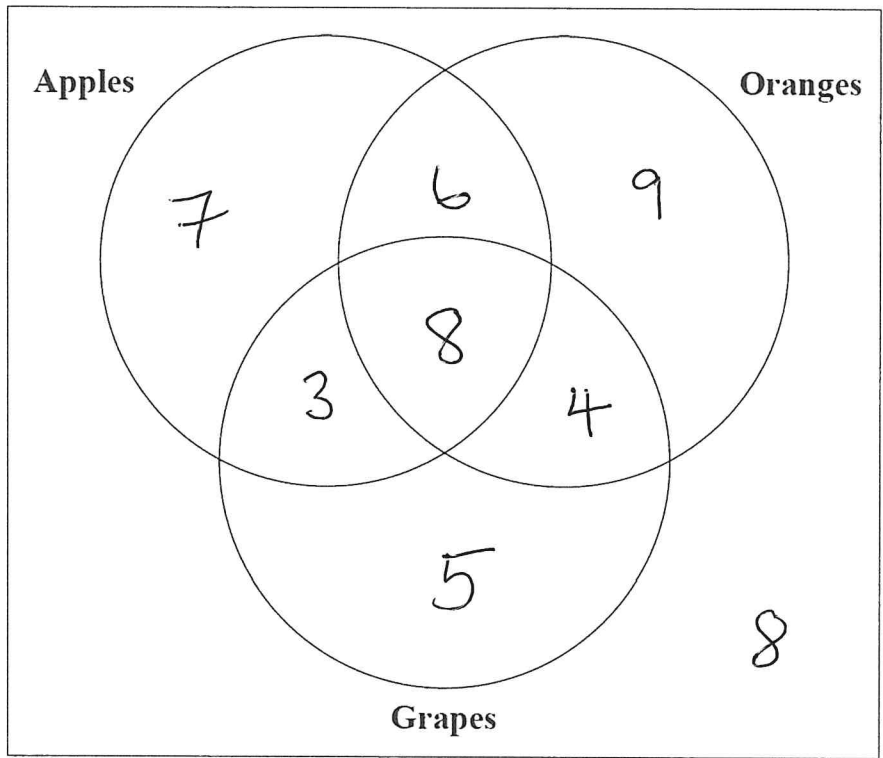
Answer  $\frac{11}{38}$  [2]

The manager of a fruit and vegetable shop kept a record of the type of fruit 50 customers bought one Friday morning.

- Q5** 27 customers bought oranges  
 20 customers bought grapes  
 24 customers bought apples  
 14 customers bought apples and oranges  
 12 customers bought oranges and grapes  
 11 customers bought apples and grapes

8 customers bought apples, oranges and grapes *Do this first*

(a) Complete the Venn diagram below to show this information.



[3]

$$50 - 7 - 6 - 9 - 3 - 8 - 4 - 5 = 8$$

(b) Use the information in the Venn diagram to find the probability that a customer, selected at random, bought:

(i) exactly two types of fruit;

$$3 + 6 + 4$$

Answer  $\frac{13}{50}$  [2]

(ii) apples if they bought grapes.

*only set*

*look at grapes*



$$\frac{3+8}{3+8+4+5}$$

Answer  $\frac{11}{20}$  [2]