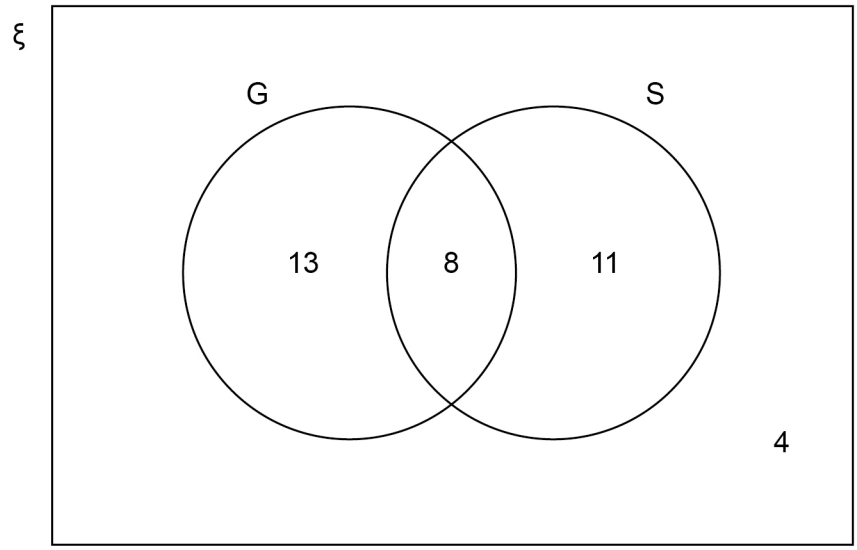
1 The Venn diagram shows information about some houses.

G = houses with a garage

S = houses with a shed



A house is chosen at random.

1 (a) The house has a garage.

What is the probability that it has a shed?

[1 mark]

Answer $\frac{8}{21}$ (1)

1 (b) The house does **not** have a garage.

What is the probability that it does **not** have a shed?

[1 mark]

Answer $\frac{4}{15}$ (1)

1 (c) Show that $P(G \cap S)' > P(G \cup S')$

[2 marks]

$= \frac{13+11+4}{36} > \frac{13+8+4}{36}$

$= \frac{28}{36} > \frac{25}{36}$ (shown)

(1) (1)

2 At a country park there is a house, a museum and a garden.

The table shows the prices per person to visit the park.

	Price per person
Garden only	Free
House and museum	£12.50
House only	£8
Museum only	£7

One day, 480 people visit the park.

67 visit the garden **only**.

40% visit the house **and** the museum. $\frac{40}{100} \times 480 = 192$

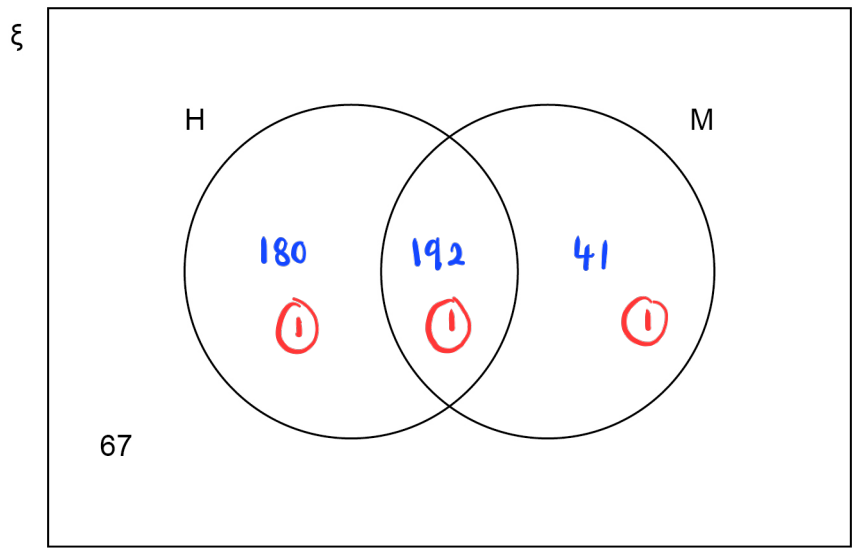
$\frac{3}{8}$ visit the house **only**. $\frac{3}{8} \times 480 = 180$

The rest visit the museum **only**. $480 - 67 - 180 - 192 = 41$

In total, how much do the 480 people pay to visit the park?

You may use the Venn diagram to help you.

[5 marks]



$192 \times 12.5 + 180 \times 8 + 41 \times 7$

$= 2400 + 1440 + 287$ (1)

$= 4127$ (1)

Answer £ 4127

3 In a group of 98 students

25 study both Art and French

10 study Art but do not study French

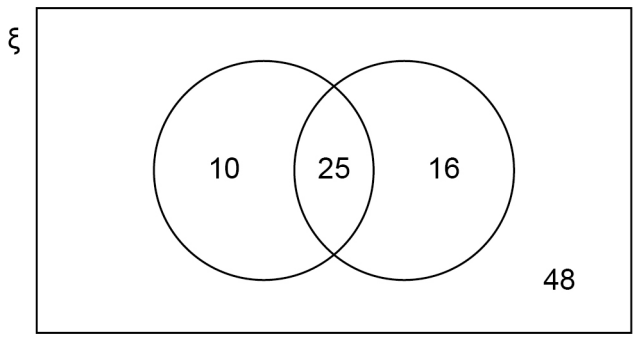
41 study French.

Joel draws this Venn diagram to represent the information.

ξ = the group of 98 students

A = the students who study Art

F = the students who study French



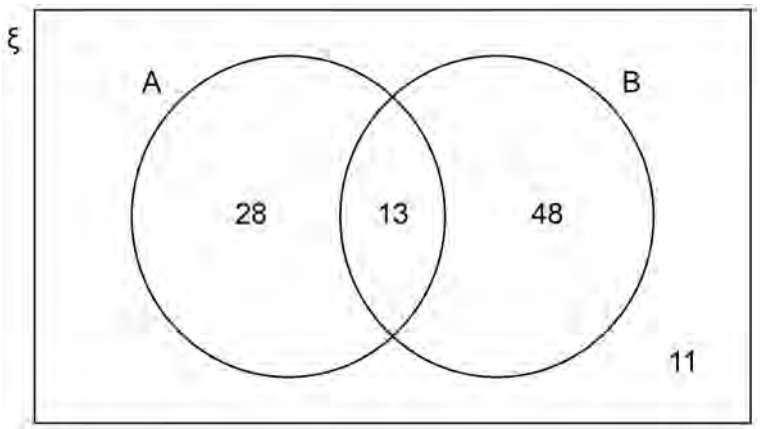
Make **two** criticisms of his diagram.

[2 marks]

Criticism 1 No labels A and F on Venn diagram (1)

Criticism 2 Total group is more than 98 (1)

4 The Venn diagram represents 100 items.



4 (a) Write down $P(A \cap B)$

[1 mark]

Answer $\frac{13}{100}$ (1)

4 (b) Work out $P(A')$

[1 mark]

$48 + 11 = 59$

Answer $\frac{59}{100}$ (1)

4 (c) Work out $P(A \cup B)$

[1 mark]

$28 + 48 + 13 = 89$

Answer $\frac{89}{100}$ (1)

5 Here is some information about 120 people who visit a shop.

$\frac{3}{4}$ of the people buy neither a coat nor a dress.

19 people buy a coat.

14 people buy a dress.

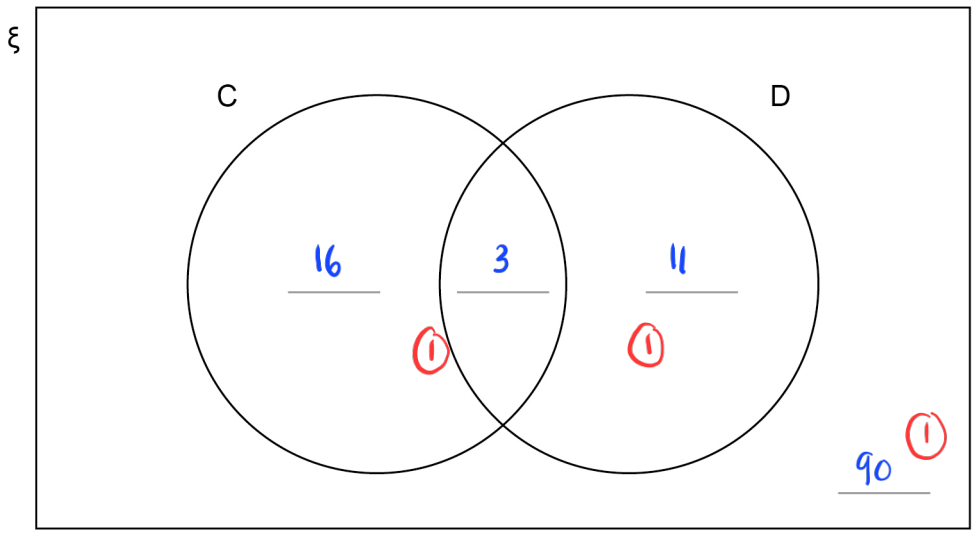
Complete this Venn diagram to represent the information.

[3 marks]

ξ = 120 people who visit the shop

C = people who buy a coat

D = people who buy a dress



$\frac{3}{4} \times 120 = 90$

$120 - 90 = 30$

$19 + 14 = 33$

$33 - 30 = 3$

6 A school year has 78 students.

28 wear glasses.

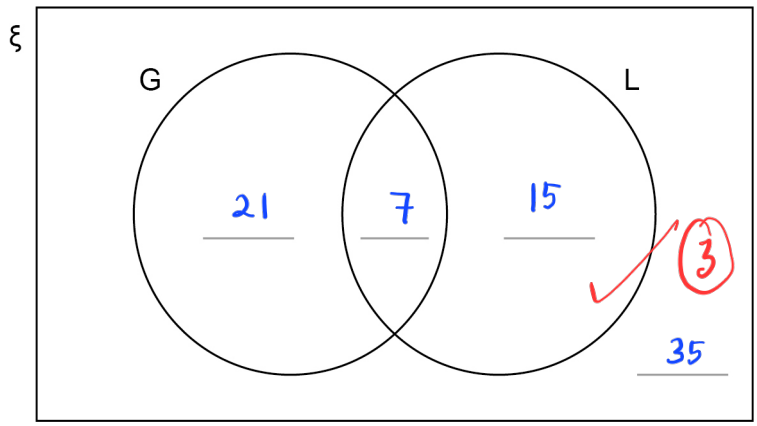
$\frac{1}{4}$ of the students who wear glasses are left-handed.

30% of the students who do **not** wear glasses are left-handed.

6 (a) ξ = students in the school year

G = wears glasses

L = left-handed



Complete the Venn diagram.

[3 marks]

wear glasses and left handed = $\frac{1}{4} \times 28 = 7$

not wearing glasses and left handed = $0.3 \times (78 - 28) = 15$

6 (b) A left-handed student is chosen at random.

Work out the probability that the student wears glasses.

[1 mark]

$\frac{7}{22}$

Answer $\frac{7}{22}$

7 On the Venn diagram, shade the section represented by $P \cap Q$

[1 mark]