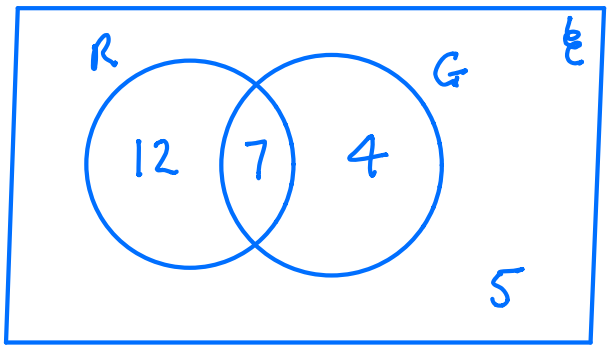
Venn Diagrams



R is the set of Right-handed students
G is the set of students who wear glasses

A student is chosen at random.

Find

1) $P(\text{student wears glasses}) = \frac{11}{28}$

2) $P(\text{left handed}) = \frac{9}{28}$

3) $P(\text{Right-handed and wear glasses}) = P(R \cap G) = \frac{7}{28}$

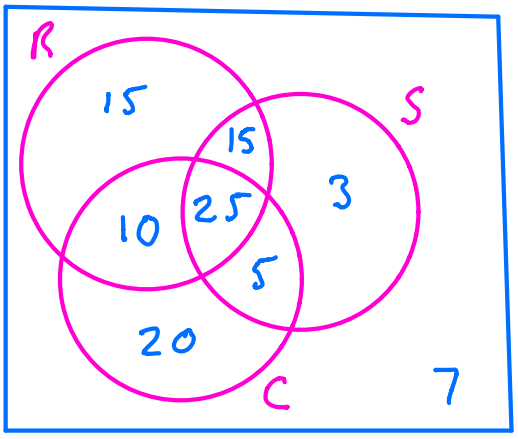
4) $P(\text{Right handed or wear glasses or both})$
$= P(R \cup G) = \frac{23}{28}$

5) Given that the chosen student wears glasses find the probability they are right-handed.
$P(R \setminus G) = \frac{7}{11}$

The following shows the results of a survey on the types of exercise taken by a group of 100 people.

65 run
48 swim
60 cycle
40 run and swim
30 swim and cycle
35 run and cycle
25 do all three

(a) Draw a Venn Diagram to represent these data.



(4)

Find the probability that a randomly selected person from the survey

(b) takes none of these types of exercise,

$P(\text{None}) = \frac{7}{100}$

$P(\text{do exactly 1 type of exercise}) = \frac{38}{100}$

Given that the person does at least two types of exercise find the probability they do all three types.

$= \frac{25}{55}$

(c) swims but does not run, $= \frac{8}{100}$

(2)

(d) takes at least two of these types of exercise.

$P(\text{do at least 2 types of exercise}) = \frac{55}{100}$ (2)

Jason is one of the above group.
Given that Jason runs,

(e) find the probability that he swims but does not cycle.

(3)

$= \frac{15}{65}$

The Venn diagram in Figure 1 shows the number of students in a class who read any of 3 popular magazines *A*, *B* and *C*.

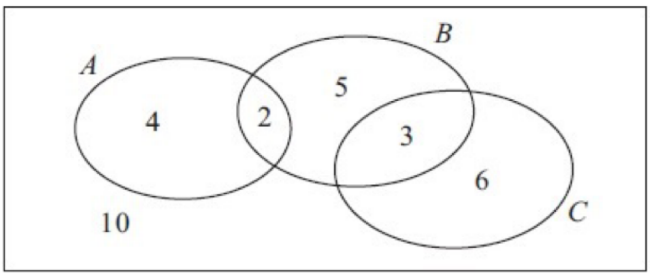


Figure 1

One of these students is selected at random.

(a) Show that the probability that the student reads more than one magazine is $\frac{1}{6}$.

$= \frac{2+3}{30} = \frac{5}{30} = \frac{1}{6}$

(2)

(b) Find the probability that the student reads *A* or *B* (or both). $= \frac{14}{30}$

(2)

(c) Write down the probability that the student reads both *A* and *C*. $= 0$

HOMEWORK QUESTION

There are 180 students at a college following a general course in computing. Students on this course can choose to take up to three extra options.

112 take systems support,

70 take developing software,

81 take networking,

35 take developing software and systems support,

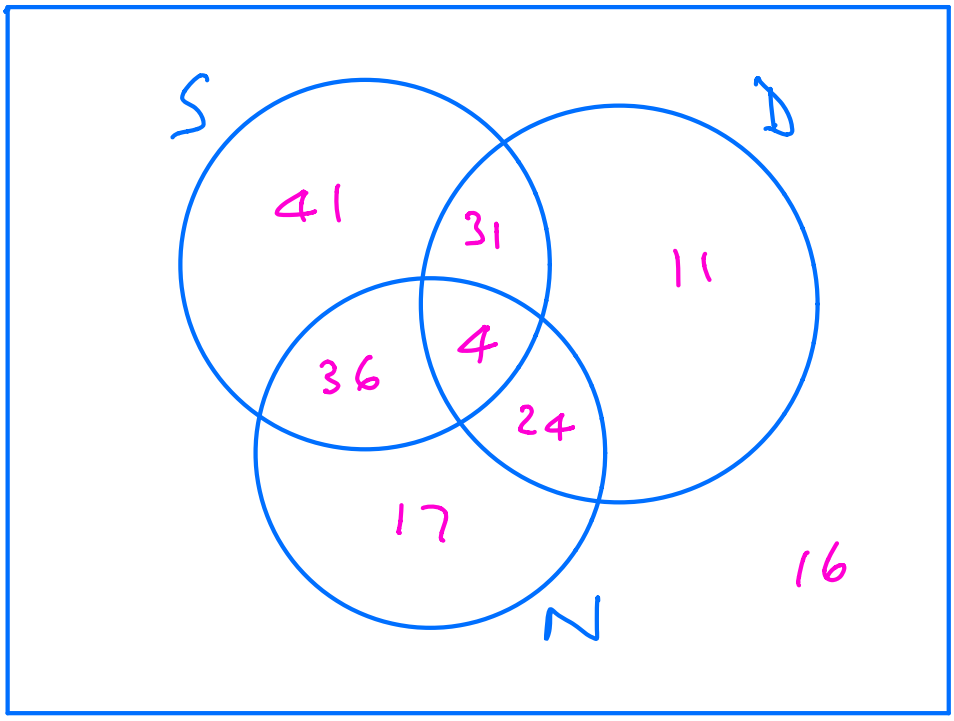
28 take networking and developing software,

40 take systems support and networking,

4 take all three extra options.

(a) In the space below, draw a Venn diagram to represent this information.

(5)



A student from the course is chosen at random.

Find the probability that this student takes

(b) none of the three extra options,

$P(\text{None}) = \frac{16}{180}$ **(1)**

(c) networking only.

$P(\text{N only}) = \frac{17}{180}$ **(1)**