

4. Answer the whole of this question on a sheet of graph paper. The table shows the amount of money, \$ x , spent on books by a group of students.

amount spent (\$ x)	number of students
$0 < x \leq 10$	0
$10 < x \leq 20$	4
$20 < x \leq 30$	8
$30 < x \leq 40$	12
$40 < x \leq 50$	11
$50 < x \leq 60$	5

- (a) Calculate an estimate of the mean amount of money per student spent on books.
- (b) Use the information in the table above to find the values of p , q and r in the following cumulative frequency table.

amount spent (\$ x)	cumulative frequency
$x \leq 10$	0
$x \leq 20$	4
$x \leq 30$	p
$x \leq 40$	q
$x \leq 50$	r
$x \leq 60$	40

- (c) Using a scale of 2 cm to represent 10 units on each axis, draw a cumulative frequency diagram.
- (d) Use your diagram:
 - (i) to estimate the median amount spent,
 - (ii) to find the upper and lower quartiles, and the inter-quartile range.

N 96 4

5. Answer the whole of this question on a sheet of graph paper. 400 apples were weighed. Their masses are given in the table below.

mass (m grams)	frequency
$80 < m \leq 100$	50
$100 < m \leq 110$	70
$110 < m \leq 120$	113
$120 < m \leq 130$	92
$130 < m \leq 160$	75

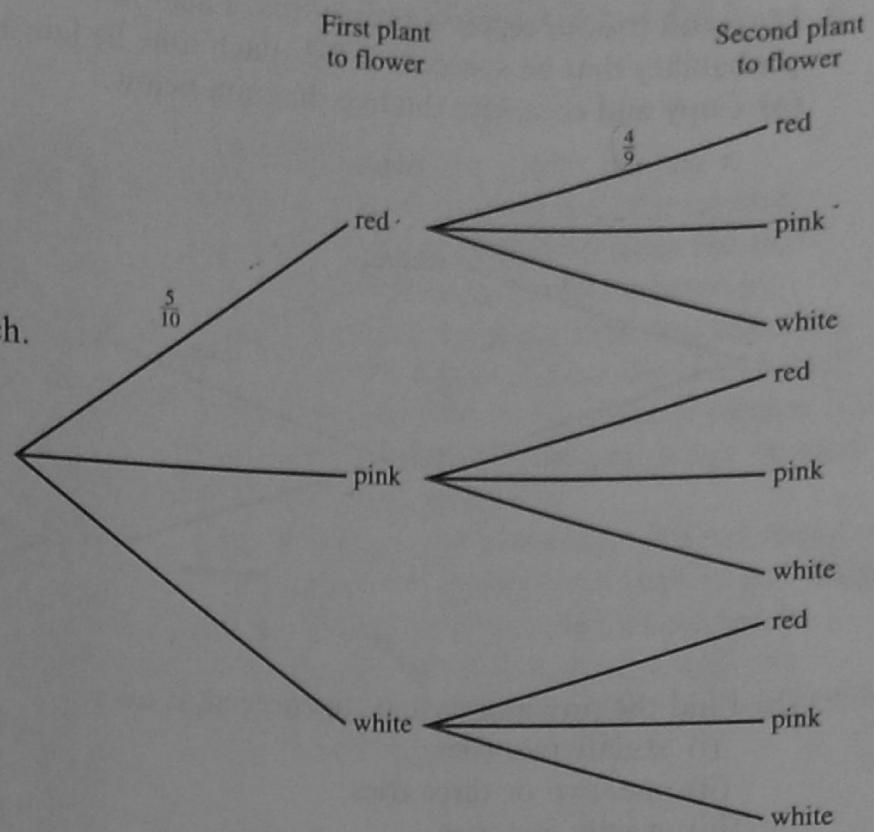
- (a) Using a scale of 2 cm to represent 10 g on the horizontal axis, and an *area* scale of 1 cm² to represent 5 apples, draw a histogram to display this data.
- (b) Calculate an estimate of the mean mass of the apples.
- (c) A supermarket will only buy apples which have a mass greater than 110 g. What percentage of the apples does the supermarket buy?

N 98 4

6. Give each of your answers to this question as a fraction.
Peter has 10 geranium plants. He knows that five will flower red, three pink and two white.

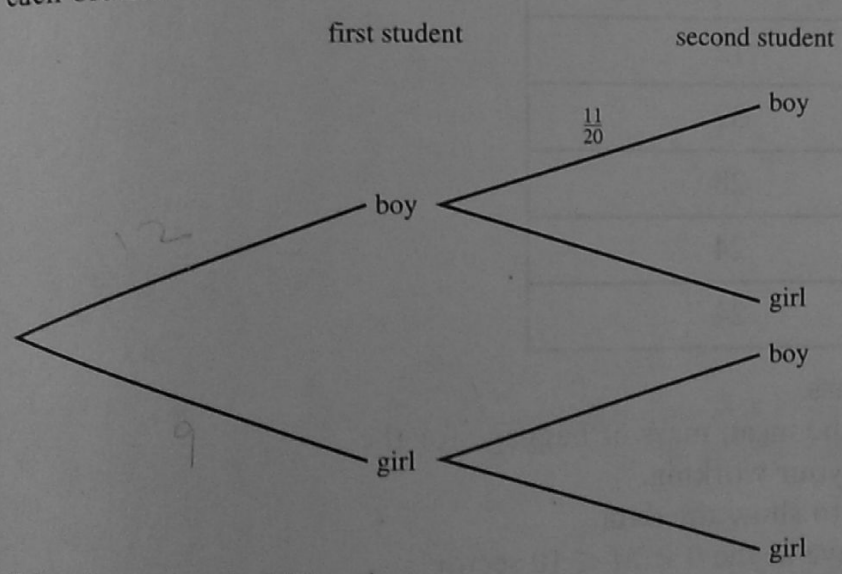
- (a) What is the probability that the first plant to flower is pink?
- (b) Copy the tree diagram. Write the correct probability on each branch.
- (c) What is the probability that, of the first two plants to flower:
 - (i) both are red,
 - (ii) one is red and the other is pink,
 - (iii) at least one is pink?
- (d) What is the probability that the first three plants to flower are all white?

N 98 4



7. Give your answers to this question as fractions in their lowest terms. There are 21 students in a class. 12 are boys and 9 are girls. The teacher chooses two students at random.

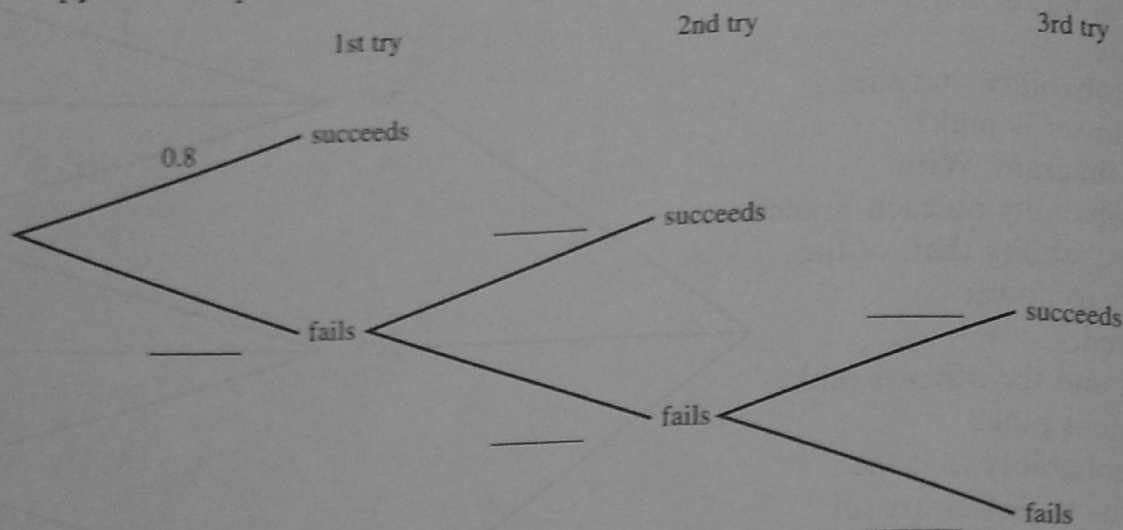
- (a) If the first student chosen is a boy, explain why the probability that the second student chosen is also a boy is $\frac{11}{20}$.
- (b) Copy the tree diagram below. Write the correct probability on each branch.



- (c) What is the probability that:
 - (i) both students are boys,
 - (ii) both students are girls,
 - (iii) one is a boy and one is a girl?
- (d) The teacher chooses a third student at random. What is the probability that:
 - (i) all three students are boys,
 - (ii) at least one of the three students is a girl?

J 96 4

8. Mamoud tries to repair a broken toy. Each time he tries the probability that he succeeds is 0.8. Each time he fails he tries again.
- (a) Copy and complete the tree diagram below.



- (b) Find the probability that, to succeed, it takes:
- exactly two tries,
 - one, two or three tries,
 - exactly five tries.
- (c) Write down a formula for the probability that he has not succeeded after n tries.

J 89 4

9. Answer the whole of this question on a sheet of graph paper. 120 passengers on an aircraft had their baggage weighed. The results are shown in the table.

Mass of baggage (M kg)	Number of passengers
$0 < M \leq 10$	12
$10 < M \leq 15$	32
$15 < M \leq 20$	28
$20 < M \leq 25$	24
$25 < M \leq 40$	24

- (a) (i) Write down the modal class.
(ii) Calculate an estimate of the mean mass of baggage for the 120 passengers. Show all your working.
(iii) Sophia draws a pie chart to show the data.
What angle should she have in the $0 < M \leq 10$ sector?
- (b) Using a scale of 2 cm to represent 5 kg, draw a horizontal axis for $0 < M \leq 40$.
Using an area scale of 1 cm^2 to represent 1 passenger, draw a histogram for this data.

N 03 4