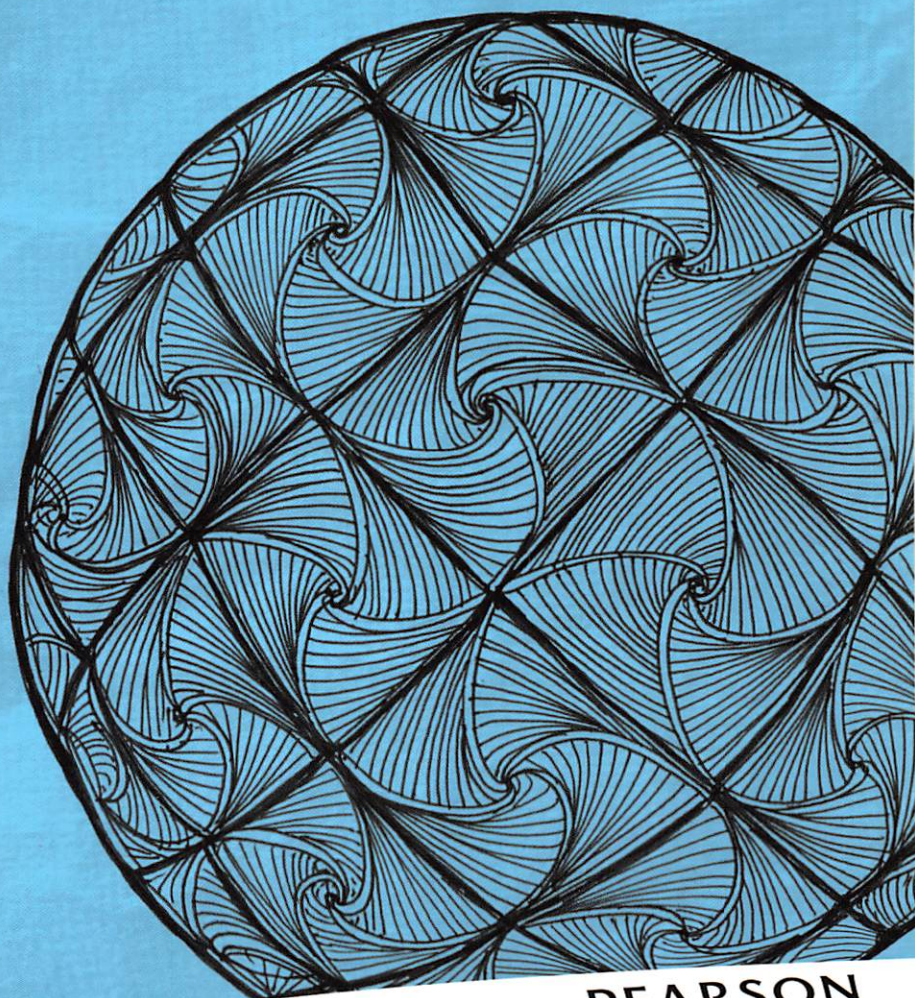
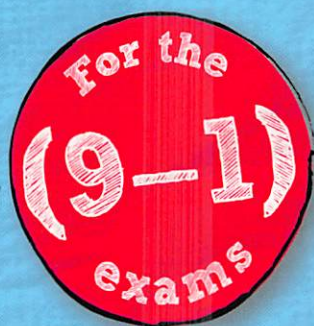


REVISE EDEXCEL GCSE (9-1)

Mathematics

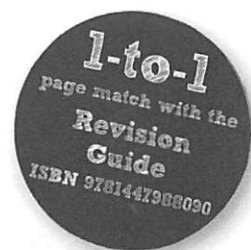
REVISION
WORKBOOK

Higher



PEARSON

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137 Answers & Imprint

A small bit of small print

Edexcel publishes Sample Assessment Material and the Specification on its website. This is the official content and this book should be used in conjunction with it. The questions in 'Now try this' have been written to help you practise every topic in the book. Remember: the real exam questions may not look like this.

Mean, median and mode



- 1 The mean of nine numbers is 62. The mean of three numbers is 52. What is the mean of the other six numbers?



Total of nine numbers = $9 \times 62 = \dots\dots\dots$

Total of three numbers = $\dots\dots\dots \times \dots\dots\dots = \dots\dots\dots$

Difference = $\dots\dots\dots - \dots\dots\dots = \dots\dots\dots$

Mean of six numbers = $\dots\dots\dots = \dots\dots\dots$

(3 marks)



PROBLEM SOLVED!

- 2 Emma has five cards. She wants to write down a number on each card such that
- the mode of the five numbers is 7
 - the median of the five numbers is 8
 - the mean of the five numbers is 9
 - the range of the five numbers is 5.

You will need to use problem-solving skills throughout your exam - **be prepared!**



Work out the five numbers on the cards.

..... (3 marks)



- 3 There are five cards with numbers written on them. X is a prime number and Y is a square number. The five cards have a mean of 11. Find X and Y .

$X = \dots\dots\dots$

$Y = \dots\dots\dots$ (3 marks)



- 4 Jacqui writes down the length, in cm, of plants on a piece of paper. She accidentally rips off the last result. Jacqui states that the mean, the median and the mode are all equal. Work out the value of the missing number.

..... (3 marks)

Frequency table averages



Guided

- 1 The table shows the numbers of goals scored by a football team in each of 30 matches.

Number of goals	Frequency	
0	7	$0 \times 7 = \dots\dots\dots$
1	9	$1 \times 9 = \dots\dots\dots$
2	6	$2 \times 6 = \dots\dots\dots$
3	5	$3 \times 5 = \dots\dots\dots$
4	3	$4 \times 3 = \dots\dots\dots$

Draw an extra column and an extra row.

Add up the final column to work out the total number of goals.

Work out

- (a) the mode

Mode is

(1 mark)

- (b) the median

Median = $\frac{30 + 1}{2}$ th value = value Median = (2 marks)

- (c) the mean

Mean = $\frac{\text{total number of goals}}{\text{total frequency}} = \frac{\dots\dots\dots}{\dots\dots\dots}$ Mean = (3 marks)

- (d) the range

Range = highest value - lowest value = - = (2 marks)



Guided

- 2 The table shows information about the number of hours spent on the internet last week by a group of students.

Number of hours	Frequency, f	Midpoint, x	$f \times x$
$0 \leq h < 2$	6	1	$1 \times 6 = \dots\dots\dots$
$2 \leq h < 4$	7	3	$3 \times 7 = \dots\dots\dots$
$4 \leq h < 6$	3	5	$5 \times 3 = \dots\dots\dots$
$6 \leq h < 8$	9	7	$7 \times 9 = \dots\dots\dots$
$8 \leq h < 10$	10	9	$9 \times 10 = \dots\dots\dots$

- (a) Work out an estimate for the mean number of hours.

Mean = $\frac{\text{total number of hours}}{\text{total frequency}} = \frac{\dots\dots\dots}{\dots\dots\dots}$

Multiply the frequency by the midpoint of each group.

Mean =

Add up the final column to work out the total number of hours.

(4 marks)

- (b) Explain why your answer to part (c) is an estimate.

..... (1 mark)

Interquartile range



1 Roseanna recorded the masses, in kg, of 15 people. Here are her results.

45 47 50 51 57 59 62 63 65 67 70 73 76 77 78



(a) Work out the range.

Range = highest value - lowest value = - = (1 mark)

(b) Work out the interquartile range.

$$\frac{1}{4}(n + 1) = \frac{1}{4}(\dots + 1) = \dots$$

So Q_1 =th value =

$$\frac{3}{4}(n + 1) = \frac{3}{4}(\dots + 1) = \dots$$

So Q_3 =th value =

Interquartile range = $Q_3 - Q_1$ = - = (2 marks)



2 The stem-and-leaf diagram shows information about the ages, in years, of some people at a shop.

0	8 9
1	3 4 4
2	2 3 7 8
3	1 1 4
4	2 3
5	1
3	1 means 31 years

(a) Work out the range.

..... years (1 mark)

(b) Work out the interquartile range

..... years (2 marks)



3 Sophie collected some information about the heights, in cm, of some shrubs.

1	7 8
2	2 5 6 7
3	3 4 8 8 9
4	2 3 5
5	5 6 7
6	1 7
3	3 means 33 cm

(a) How many shrubs did Sophie measure?

..... (1 mark)

(b) Work out the range.

..... cm (1 mark)

(c) Work out the median.

..... cm (1 mark)

(d) Work out the interquartile range

..... cm (2 marks)

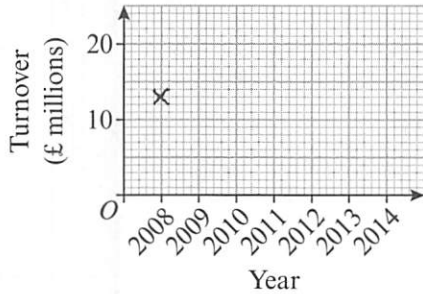
Line graphs



1 The table shows information about the annual turnover of a company, in millions of pounds.

Year	Turnover (£ millions)
2008	13
2009	10
2010	12
2011	13
2012	15
2013	16
2014	18

(a) Draw a time series graph to represent this data.



Plot the points from the table.

(2 marks)

(b) Describe the trend.

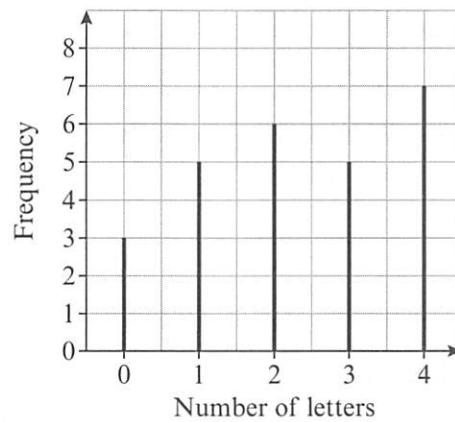
Use the correct language: upwards or downwards.

(1 mark)



Guided

2 Joe recorded the number of letters he received each day for a period of time. The graph gives some information about his results.



(a) Write down the modal number of letters.

..... (1 mark)

(b) Work out the total number of letters Joe received during this period of time.

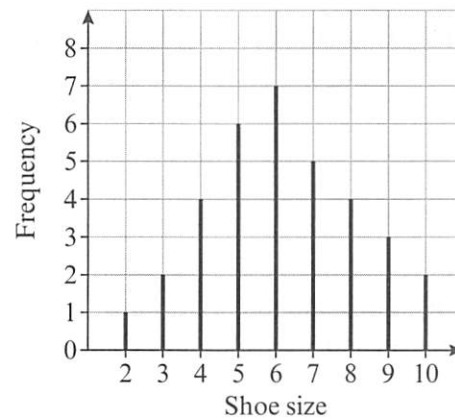
$(0 \times 3) + (1 \times \dots) + (2 \times \dots) + (\dots \times \dots) + (\dots \times \dots) = \dots$ (2 marks)



PROBLEM SOLVED!

3 The vertical line graph shows the shoe sizes of some children.

You will need to use problem-solving skills throughout your exam - **be prepared!**



(a) Write down the modal shoe size.

..... (1 mark)

(b) Work out the mean shoe size.

..... (3 marks)

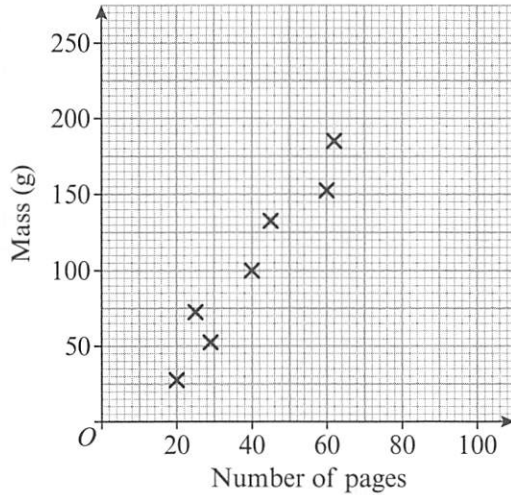
Scatter graphs



PROBLEM SOLVED!

- 1 The masses of seven magazines and the number of pages in each magazine were recorded. The scatter graph gives information about the results.

You will need to use problem-solving skills throughout your exam – **be prepared!**



- (a) What type of correlation does this scatter graph show?

..... (2 marks)

- (b) Estimate the mass, in g, of a magazine with 50 pages.

..... g (2 marks)

Draw a line of best fit.

- (c) Estimate the mass, in g, of a magazine with 80 pages.

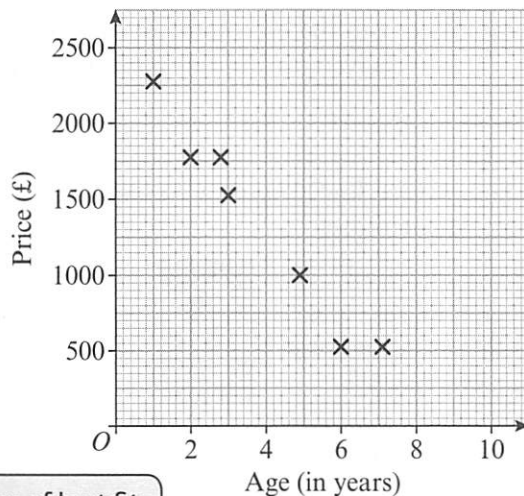
..... g (2 marks)

- (d) Write down a comment explaining explaining why your estimate in part (c) might not be accurate.

..... (2 marks)



- 2 The scatter graph gives information about the price and age of motorbikes.



- (a) Describe the relationship between the age of a motorbike and its cost.

..... (2 marks)

- (b) Estimate the price, in £, of a 4-year-old motorbike.

£..... (2 marks)

Draw a line of best fit.

- (c) Comment on the reliability of the estimate in part (b).

..... (1 mark)

- (d) Jean says that this graph cannot be used to find the price of a motorbike that is 10 years old. Is Jean correct? Explain your answer.

..... (1 mark)

Sampling



1 Tony is conducting a survey for a magazine on the spending habits of people at a local shopping centre. He plans to survey the first 9 people in a queue at one shop on one Sunday morning for a sample.

(a) Write down one advantage of taking a sample.

..... (1 mark)

(b) Comment on the reliability of this sample.

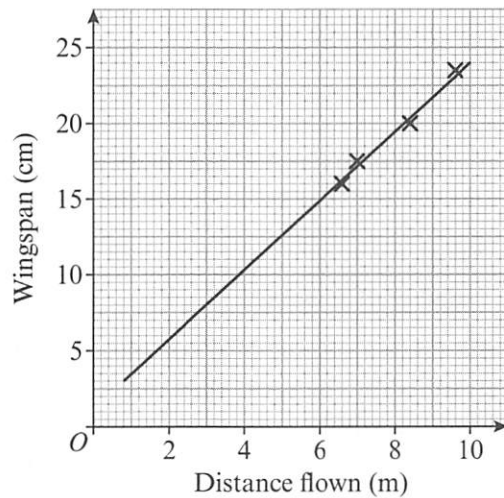
..... (1 mark)

(c) Write down one way of reducing bias in this sample.

..... (1 mark)



2 An experiment is carried out by flying paper aeroplanes. The scatter graph shows some information about the distances flown, in m, and the wingspans, in cm. A line of best fit has been drawn.



(a) Use the line of best fit to estimate the wingspan, in cm, of a paper aeroplane which has flown 9 m.

..... cm (1 mark)

(b) Use your line of best fit to estimate the distance flown, in m, of a paper aeroplane which has a wingspan of 5 cm.

..... m (1 mark)

Draw a line from the line of best fit to the axis.

(c) Which of your estimates in part (a) or part(b) is more reliable? Give a reason for your answer.

..... (2 marks)

(d) Write down one way you could improve this experiment to increase the accuracy of your estimates.

..... (1 mark)

Stratified sampling



- 1 A school has 750 students. Each student studies one of Latin, Spanish, French and German. The table shows the number of students who study each of these languages.

Guided

Language	Latin	Spanish	French	German
Number of students	170	146	220	214

Peter takes a sample of 50 of these students stratified by the language studied. Find the number of students in his sample who study German.

$\frac{214}{750} \times \dots\dots\dots = \dots\dots\dots$ (2 marks)



- 2 The grouped frequency table shows information about the heights, in centimetres, of 30 students, chosen at random from Year 12.

Height (h cm)	$120 < h \leq 135$	$135 < h \leq 150$	$150 < h \leq 165$	$165 < h \leq 180$	$180 < h \leq 195$
Frequency	4	5	11	7	3

There are 360 students in Year 12. Work out an estimate for the number of students in Year 12 whose height is between 150 cm and 165 cm.

..... (3 marks)



- 3 A youth club has 450 members. Each member can play one of football, tennis, rugby and squash. The table shows the number of members who play each of these sports.

Sport	Football	Tennis	Rugby	Squash
Number of members	95	68	151	136

Bill takes a sample of 65 of these members, stratified by the sport they play. Find the number of members playing each of these sports that should be in the sample.

Make sure you count the number of members in the sample so that it adds up to 65.

..... (3 marks)



- 4 The table shows information about the number of people who attended a local charity event. Gary is going to take a sample of 55 of these people stratified by gender and by age.

		Age		
		Under 19	19 to 39	Over 39
Gender	Male	136	183	85
	Female	158	200	138

Calculate the number of males aged over 39 that should be in his sample.

..... (3 marks)

Capture–recapture



- 1 Alice wants to estimate the number of frogs in a lake. She catches a sample of 70 frogs, marks them and puts them back in the lake. Later that day, in a second sample of 60 frogs, she finds that 8 of them are marked. Work out an estimate for the number of frogs in the lake.



Using $N =$

$$\frac{Mn}{m} = \frac{\dots \times \dots}{8}$$

$$= \dots\dots\dots$$

(3 marks)



- 2 Bart wants to find an estimate for the number of ants in a colony. He catches 75 ants from the colony and marks each one with a dye. He then returns the ants to the colony. A week later, Bart catches another 80 ants. Eight of these ants are marked with the dye. Work out an estimate for the number of ants in the colony.

..... (3 marks)



- 3 Carl has a box containing a large number of beads. He wants to find an estimate for the number of beads in the box. Carl takes a sample of 40 beads from the box. He marks each bead with a black tick. He then puts the beads back in the box and shakes the box. He now takes another sample of 50 beads from the box. Four of these beads have been marked with a black tick. Work out an estimate for the total number of beads in the box.



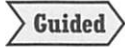
You will need to use problem-solving skills throughout your exam – **be prepared!**

..... (3 marks)

Cumulative frequency



1 The cumulative frequency diagram gives information about the masses in grams of a number of letters.



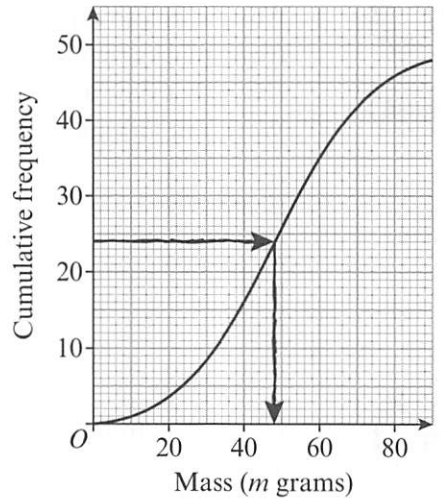
(a) Use the graph to find an estimate for the median mass.

$$\frac{1}{2}n = \frac{1}{2}(48) = \dots\dots\dots$$

Median =th value

=g **(2 marks)**

Use the cumulative frequency axis to work out the total number of letters n . The median weight is found at half the total number.



(b) Use the graph to find an estimate for the interquartile mass of the masses.

$$\frac{1}{4}n = \frac{1}{4}(48) = \dots\dots\dots$$

LQ =th value =g

$$\frac{3}{4}n = \frac{3}{4}(48) = \dots\dots\dots$$

UQ =th value =g

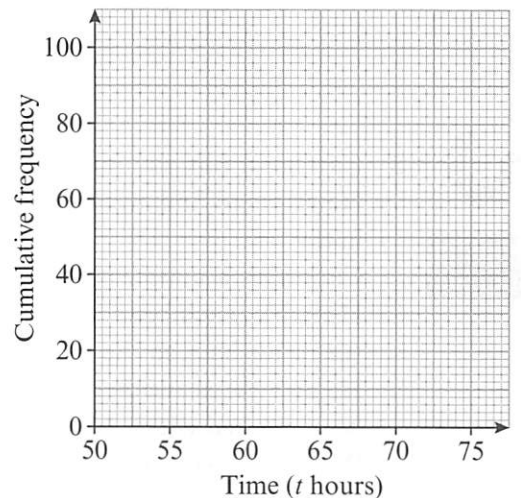
IQR = UQ - LQ = - =g **(2 marks)**



2 The table shows information about the time, in hours, that batteries lasted in TV remote controls.

Time (t hours)	Cumulative frequency
$50 \leq t < 55$	11
$50 \leq t < 60$	32
$50 \leq t < 65$	68
$50 \leq t < 70$	93
$50 \leq t < 75$	100

(a) On the grid, draw a cumulative frequency graph to show this information. **(2 marks)**



(b) Use the graph to find an estimate for the median.

..... hours **(2 marks)**

(c) Use the graph to find an estimate for the interquartile range.

..... hours **(2 marks)**

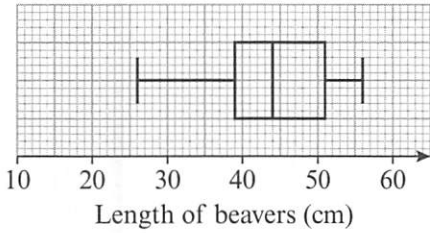
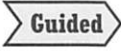
(d) Tom says 15% of the batteries lasted more than 68 hours. Is Tom correct? You must give a reason for your answer.

..... **(2 marks)**

Box plots



1 The box plot shows the lengths, in cm, of a group of beavers.



(a) Write down the median length.

Median length = cm (1 mark)

(b) Work out the interquartile range of the lengths.

IQR = UQ - LQ = - = cm (2 marks)

(c) There are 60 beavers at a sanctuary.

Estimate the number of beavers shorter than 41 cm.

Number of beavers shorter than 41 cm =% of 60 = (2 marks)

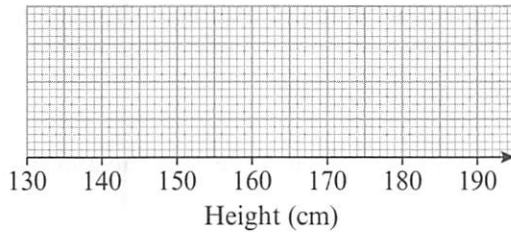


2 Jean records the heights of actors that attend the local theatre.

The height of the shortest actor is 144 cm. The height of the tallest actor is 185 cm.

The median is 162 cm. The upper quartile is 173 cm. The interquartile range is 16 cm.

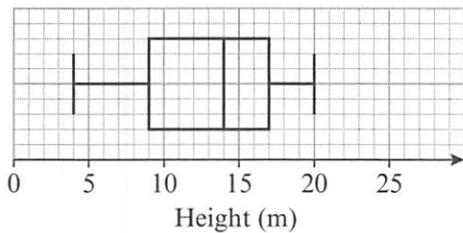
On the grid, draw the box plot for the heights of the actors at the local theatre.



(3 marks)



3 The box plot gives information about the distribution of the heights of all the trees in a wood.



(a) What percentage of trees are taller than 9 m?

.....% (1 mark)

(b) There are 240 trees in the wood. Estimate how many trees are between 9 m and 14 m

..... (2 marks)

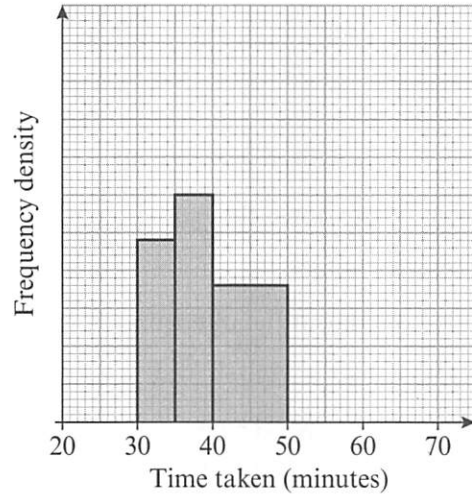
Histograms



- 1 George recorded the time it took him to travel to work.
The table and the histogram give some of this information.

Guided

Time taken (t minutes)	Frequency (f)
$20 < t \leq 30$	7
$30 < t \leq 35$	12
$35 < t \leq 40$	
$40 < t \leq 50$	
$50 < t \leq 70$	8



- (a) Use the information in the histogram to complete the table.

Frequency density, FD = frequency \div class width

FD of $30 < t \leq 35 = \dots \div \dots = \dots$ (2 marks)

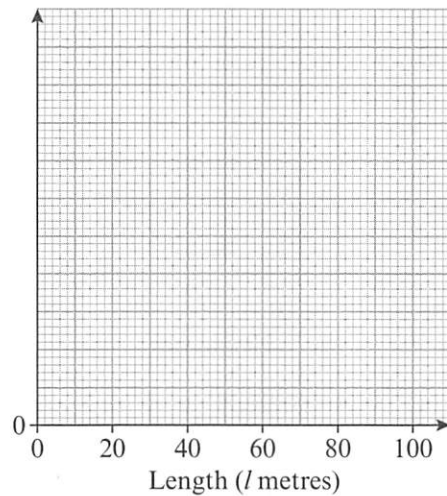
Use your calculated frequency densities to number the FD axis on the histogram.

- (b) Use the information in the table to complete the histogram. (2 marks)



- 2 The table gives information about the lengths, in metres, of the hedges of the gardens in one street.

Length (l metres)	Frequency
$0 < l \leq 40$	25
$40 < l \leq 60$	36
$60 < l \leq 80$	14
$80 < l \leq 90$	5



- (a) Draw a histogram to represent the information in the table. (3 marks)
 (b) Estimate the number of hedges between 48 m and 84 m in length.

..... (2 marks)

Frequency polygons



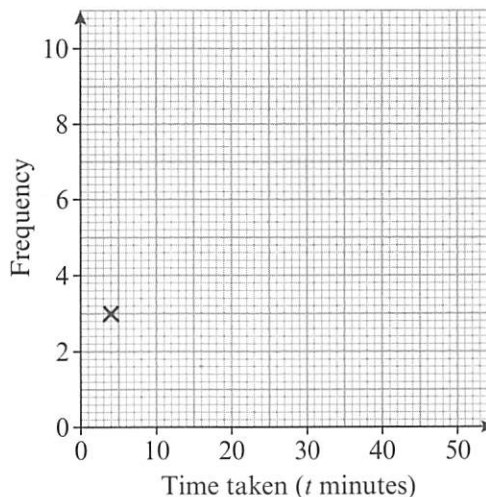
- 1 Jay asked some people how many minutes they each took to walk to the library. The table shows some information about his results.

Guided

Time taken (t minutes)	Frequency
$0 < t \leq 10$	3
$10 < t \leq 20$	8
$20 < t \leq 30$	10
$30 < t \leq 40$	4

- (a) On the grid, draw a frequency polygon to represent the information in the table.

Add an extra column to the table for the midpoints of each class interval. Plot the points for each midpoint.



Join the 4 points with 3 straight lines.

1st point at (5, 3)

2nd point at (15,)

(2 marks)

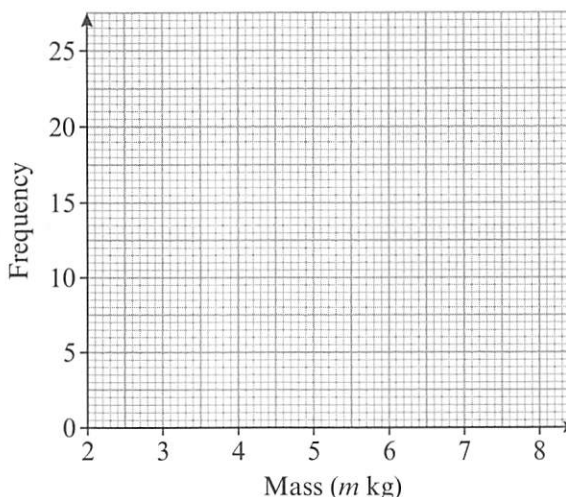
- (b) Write down the modal class.

..... (1 mark)



- 2 Kerry recorded the masses, in kg, of 70 ornaments.

Mass (m kg)	Frequency
$2.5 < m \leq 3.5$	6
$3.5 < m \leq 4.5$	10
$4.5 < m \leq 5.5$	15
$5.5 < m \leq 6.5$	22
$6.5 < m \leq 7.5$	17



- (a) On the grid, draw a frequency polygon to represent the information in the table. (2 marks)

- (b) Write down the class interval which contains the median.

..... (1 mark)

Comparing data



- 1 The exam marks of classes 11A and 11B are shown in the back-to-back stem-and-leaf diagram.



11A	5	11B
5 4 1	5	
8 6 3 2	6	2 3 4
8 7 5 4	7	1 3 6 7
2	8	5 6 8
	9	3

Key: 1 | 5 represents 51 marks Key: 6 | 2 represents 62 marks

Compare the results of class 11A with the results of class 11B.

Work out the median and the range and then use these values to compare the data.

The median for class 11A is The range for class 11A

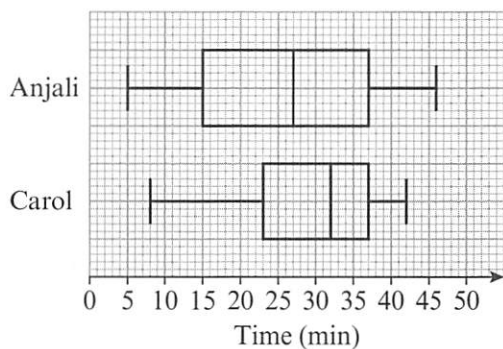
is - =

.....

(2 marks)



- 2 These box plots give information about the times taken by Anjali and Carol to each complete some puzzles.



Compare the distributions of the times taken for Anjali and Carol to complete the puzzles. Write down two comparisons.

.....

(2 marks)

Always compare median and range or interquartile range.

Probability



Guided

- 1 A box contains cartons of orange juice, apple juice and mango juice. The table shows each of the probabilities that a carton of juice taken at random from the box will be orange or apple.

Carton of juice	Orange	Apple	Mango
Probability	0.3	0.4	

The probabilities must add up to 1.

A carton is to be taken at random from the box. Work out the probability that the carton

- (a) will be an orange juice or an apple juice

0.3 + = (2 marks)

- (b) will be a mango juice.

1 - (..... +) = (2 marks)



Guided

- 2 A bag contains red, green, white and blue counters. The table shows each of the probabilities that a counter taken at random will be red or green or white.

Colour	Red	Green	White	Blue
Probability	0.35	0.28	0.16	

A counter is to be taken at random from the bag. Work out the probability that the counter will be blue.

1 - (..... + +) = (2 marks)



- 3 A spinner can land on A, B, C or D. The table shows information that the spinner will land on each letter B or C or D.

Letter	A	B	C	D
Probability		0.26	0.36	0.17

The spinner is spun once. Work out the probability that the spinner will land on

- (a) B or C

- (b) A.

..... (2 marks)

..... (2 marks)



PROBLEM SOLVED!

- 4 Four athletes Andy, Ben, Carl and Daljit take part in a race. The table shows the probabilities of Andy or Ben winning the race.

You will need to use problem-solving skills throughout your exam – **be prepared!**

Athlete	Andy	Ben	Carl	Daljit
Probability	0.3	0.38		

The probability that Carl will win is 3 times the probability that Daljit will win. Work out the probability that the race will be won by

- (a) Andy or Ben

- (b) Daljit.

..... (2 marks)

..... (2 marks)

Relative frequency



- 1 The table shows information about the number of orders received each month for six months by an internet company.



Month	Jan	Feb	Mar	Apr	May	Jun
Number of orders	28	63	49	61	53	48

An order is chosen at random.

Work out the probability that the order was received in

- (a) May

53

.....

First work out the total number of orders.

(2 marks)

- (b) Jan or Feb or Mar

28 + + =

.....

.....

Add up the numbers for Jan, Feb and Mar.

(2 marks)



- 2 The table shows the total scores when Ethan throws three darts 50 times.



Score	1–30	31–60	61–90	91–120	121–150	151–180
Frequency	14	10	9	8	6	3

He throws another three darts. Estimate the probability that he scores

- (a) between 31 and 60

..... out of 50 = $\frac{\text{.....}}{50}$

(1 mark)

- (b) more than 90

..... (2 marks)

- (c) 120 or less.

..... (2 marks)



- 3 A garage keeps records of the cost of repairs it makes to vans. The table gives information about the costs of all repairs which were less than £500 in one month.

Cost (£C)	Frequency
$0 < C \leq 100$	20
$100 < C \leq 200$	39
$200 < C \leq 300$	72
$300 < C \leq 400$	33
$400 < C \leq 500$	38

- (a) Amy needs to repair her van.
Estimate of the probability that the cost of her repair is more than £200.

..... (2 marks)

- (b) Comment on the accuracy of your estimate.

..... (1 mark)

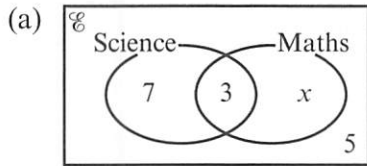
Venn diagrams



Guided

1 These Venn diagrams represent the subjects studied at college by a group of 30 students. For each diagram

- (i) work out the value of x
- (ii) write down the set that x represents.

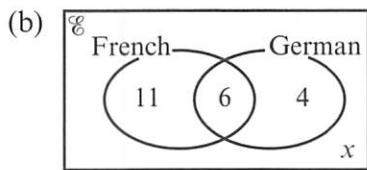


(i) $30 - (\dots + \dots + \dots)$
 $x = \dots$

(1 mark)

(ii) Students who only study

(1 mark)



- (i)
- (ii)

(1 mark)

(1 mark)

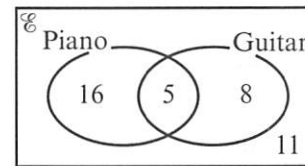


2 A and B are two events. $P(A) = 0.5$, $P(B) = 0.2$ and $P(A \cap B) = 0.1$. Find

- (a) $P(A \cup B)$ (2 marks)
- (b) $P(A')$ (2 marks)
- (c) $P(A \cap B')$ (2 marks)



3 The Venn diagram shows information about musical instruments played by 40 students. A student is chosen at random. Work out the probability that this student



- (a) plays the piano and the guitar (2 marks)
- (b) plays neither instrument. (2 marks)



PROBLEM SOLVED!

4 In a class of 30 students, 10 own a PlayBox4, 12 own an X-Station and 4 own both.

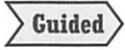
You will need to use problem-solving skills throughout your exam - **be prepared!**

- (a) Draw a Venn diagram to represent this information. (2 marks)
- A student is chosen at random. Work out the probability that this student
- (b) does not own a PlayBox4 and does not own an X-Station. (2 marks)
- (c) owns a PlayBox4 or an X-Station but not both. (2 marks)

Conditional probability



1 The two-way table gives information about the number of people who have enrolled for mathematics night classes at a college.



- (a) One of the males is picked at random.
What is the probability that he is under 19?

	Under 19	Over 19
Male	85	134
Female	198	83

Number of males = $85 + 134 = \dots\dots\dots$

Number of males under 19 = $\dots\dots\dots$

Probability = $\dots\dots\dots$

(2 marks)

- (b) One of the under-19s is picked at random.
What is the probability that the person picked is male?

Number of under-19s = $\dots\dots\dots + \dots\dots\dots = \dots\dots\dots$

Number of males under 19 = $\dots\dots\dots$

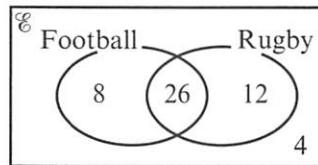
Probability = $\dots\dots\dots$

(2 marks)



PROBLEM SOLVED!

2 The Venn diagram shows information about the different sports played by 50 students.
A student is picked at random.



You will need to use problem-solving skills throughout your exam - **be prepared!**

- (a) Find the probability that the student plays football, given that the student also plays rugby.

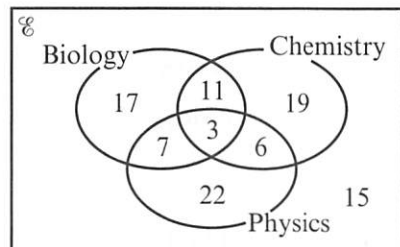
$\dots\dots\dots$ (2 marks)

- (b) Find the probability that the student plays both sports given that the student plays at least one sport.

$\dots\dots\dots$ (2 marks)



3 The Venn diagram shows information about the different science subjects chosen by 100 students.



- (a) A student is picked at random. Given that the student chooses chemistry, find the probability that the student also chooses physics.

$\dots\dots\dots$ (2 marks)

- (b) A second student is chosen at random. Given that the student does not choose biology, find the probability that the student chooses chemistry.

$\dots\dots\dots$ (3 marks)

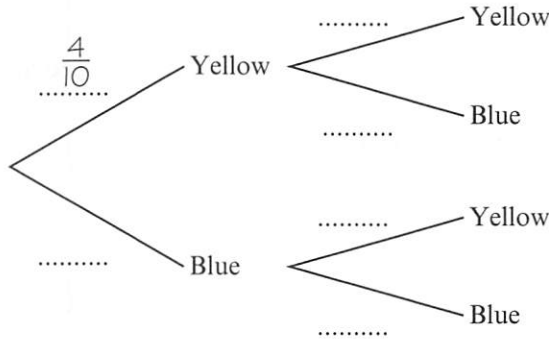
Tree diagrams



Guided

- 1 A jar contains 4 yellow sweets and 6 blue sweets.
A sweet is picked at random and not replaced.
A second sweet is then picked.

(a) Complete the tree diagram for this information.



(2 marks)

Find the probability that

- (b) the second sweet is yellow given that the first sweet is blue

$\frac{\dots\dots}{9}$

(1 mark)

- (c) both sweets are yellow

$\frac{\dots\dots}{10} \times \frac{\dots\dots}{9} = -$

(2 marks)

- (d) the sweets are of different colours.

$\left(\frac{\dots\dots}{10} \times \frac{\dots\dots}{9}\right) + \left(\frac{\dots\dots}{10} \times \frac{\dots\dots}{9}\right) = -$

(3 marks)



- 2 The probability that a certain disease occurs in a population is 0.15.
If the patient has the disease, the probability that a screening procedure produces a positive result is 0.7.
If the patient does not have the disease, there is still a 0.1 chance that the test will give a positive result.

Find the probability that a randomly selected individual

- (a) does not have the disease but gives a positive result in the screening test

Draw a tree diagram.

..... (3 marks)

- (b) gives a positive result in the test.

..... (2 marks)

Problem-solving practice 1



- 1 A school snack bar offers a choice of four snacks. The four snacks are burgers, wraps, fruit and salad. Students can choose one of these four snacks. The table shows the probability that a student will choose a burger or a wrap.

Snack	Burger	Wrap	Fruit	Salad
Probability	0.25	0.15		

The probability that a student chooses fruit is twice the probability that a student of chooses salad.

One student is picked at random from the students who use the snack bar.

- (a) Work out the probability that the student

(i) does not choose a burger

..... (2 marks)

(ii) chooses salad.

..... (2 marks)

- (b) 200 students used the snack bar on Tuesday.

Work out an estimate for the number of students who chose a wrap.

..... (2 marks)



- 2 The heights, in cm, of some plants were measured in Park A and in Park B. The information is shown in the back-to-back stem-and-leaf diagram.

Park A		Park B
	1	0 3 4
3 3 1	2	1 2 5 7
6 5 2 0	3	3 4 6 7
7 5 4	4	2
2	5	

Compare the heights of plants in Park A with the heights of plants in Park B.

Key: 1 | 2 represents 21 cm Key: 1 | 0 represents 10 cm

.....
..... (2 marks)



- 3 In a class of 25 students, 8 study Latin, 10 study Mandarin and 3 study both. A student is picked at random. Find the probability that the student

(a) does not study Latin and does study Mandarin

..... (3 marks)

(b) studies Latin or Mandarin but not both.

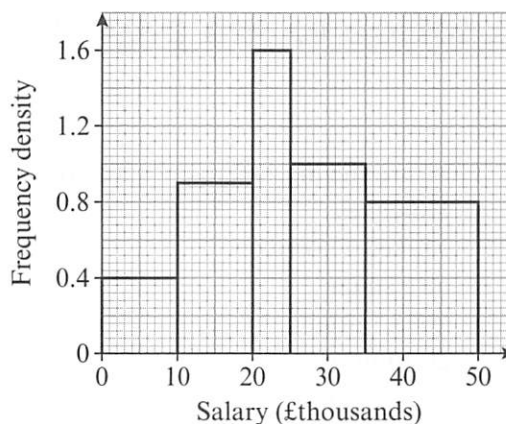
..... (2 marks)

Problem-solving practice 2



- 4 The histogram shows information about the salaries of a sample of people.

Work out the proportion of people in the sample who have a salary between £10 000 and £35 000.



..... (4 marks)



- 5 There are n counters in a jar.

7 of the counters are red. The rest of the counters are green.

Keiran takes a counter at random from the jar and places it on the table.

He then takes another counter at random from the jar and places it on the table.

The probability that Keiran takes two red counters is $\frac{1}{5}$.

Work out the number of counters in the jar.

..... (5 marks)



- 6 80 students each study one of three languages.

The languages are French, German and Spanish.

There are 39 females who study a language. 15 females study French.

17 of the males study German. 8 of the 21 students who study Spanish are male.

One of these students is picked at random.

- (a) Work out the probability that the student picked studies French.

..... (4 marks)

- (b) Given that the student studies German, find the probability that the student is male.

..... (2 marks)

PROBABILITY & STATISTICS

110. Mean, median and mode

- 1 67
 2 7, 7, 8, 11, 12
 3 $X = 2$ and $Y = 16$
 4 32

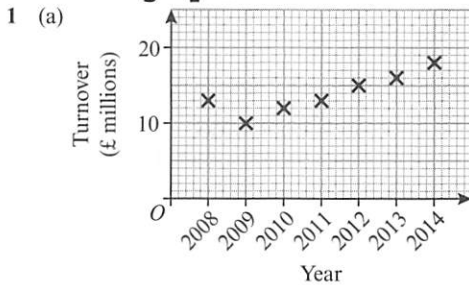
111. Frequency table averages

- 1 (a) 1 (b) 1 (c) 1.6 (d) 4
 2 (a) 5.6
 (b) Working with grouped data

112. Interquartile range

- 1 (a) 33 (b) 22
 2 (a) 43 (b) 20
 3 (a) 19 (b) 50 (c) 38 (d) 29

113. Line graphs



- (b) Upwards
 2 (a) 4
 (b) 60
 3 (a) 6
 (b) 6.2

114. Scatter graphs

- 1 (a) Positive
 (b) 135 g
 (c) 235 g
 (d) 80 pages is out of the data range
 2 (a) Negative (b) 1250
 (c) Reliable, as it is within the data range
 (d) Gives a negative price

115. Sampling

- 1 (a) It is quick, cheap and easier to handle
 (b) Not very reliable, because sample is small
 (c) Ask more people on different days
 2 (a) 21.5
 (b) 1.7
 (c) Part (a), because it is in the data range
 (d) Carry out more experiments

116. Stratified sampling

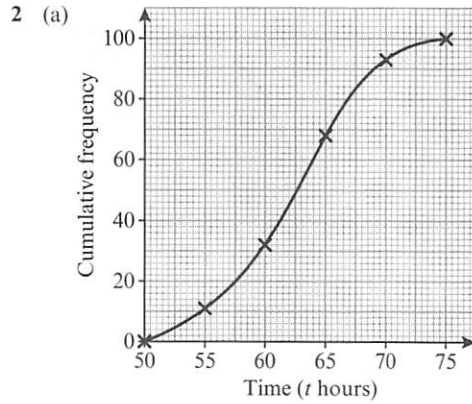
- 1 14
 2 132
 3 14, 10, 21, 20
 (One of these needs to be rounded down, so an alternative answer is 14, 10, 22, 19)
 4 5

117. Capture-recapture

- 1 525
 2 750
 3 500

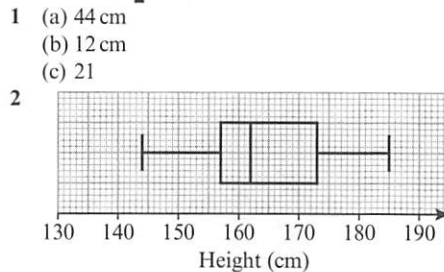
118. Cumulative frequency

- 1 (a) 48 g
 (b) 27 g



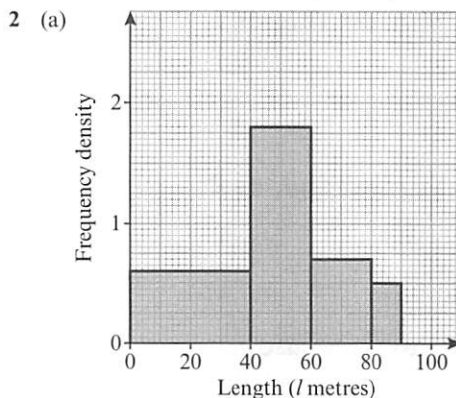
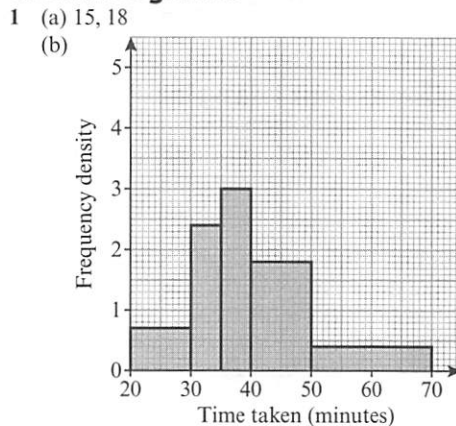
- (b) 62.5
 (c) 7.5
 (d) 68 hours = 86%, so 14% last longer, not 15%. Tom is incorrect

119. Box plots



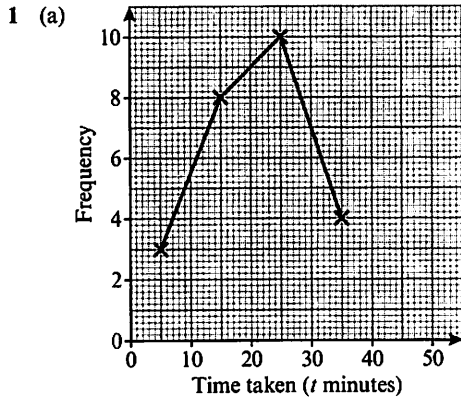
- 3 (a) 75%
 (b) 60

120. Histograms

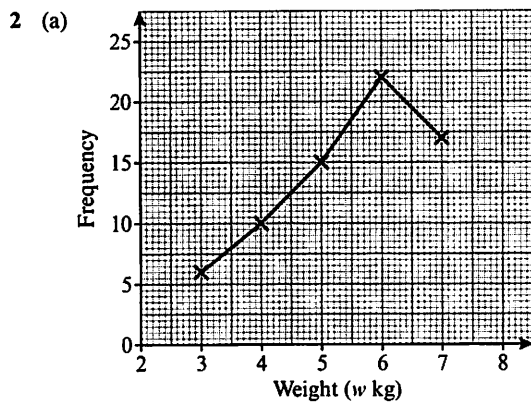


- (b) 38

121. Frequency polygons



(b) $20 < t \leq 30$



(b) $5.5 < w \leq 6.5$

122. Comparing data

- The median in class 11A is lower than the median in class 11B. The range for both classes is the same
- Anjali has a larger range/IQR. Carol has a higher median

123. Probability

- (a) 0.7 (b) 0.3
- 0.21
- (a) 0.62 (b) 0.21
- (a) 0.68 (b) 0.08

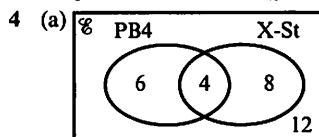
124. Relative frequency

- (a) $\frac{53}{302}$ (b) $\frac{140}{302}$
- (a) $\frac{1}{5}$ (b) $\frac{17}{50}$ (c) $\frac{41}{50}$
- (a) $\frac{143}{202}$

(b) Quite accurate, because a large sample

125. Venn diagrams

- (a) (i) 15 (ii) Maths
(b) (i) 9 (ii) Do not study French nor German
- (a) 0.6 (b) 0.5 (c) 0.4
- (a) $\frac{1}{8}$ (b) $\frac{11}{40}$



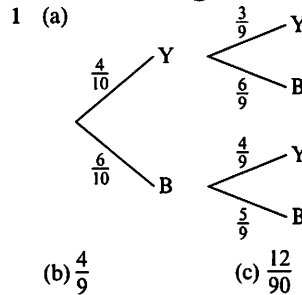
(b) $\frac{12}{30}$

(c) $\frac{14}{30}$

126. Conditional probability

- (a) $\frac{85}{219}$ (b) $\frac{85}{183}$
- (a) $\frac{26}{38}$ (b) $\frac{26}{46}$
- (a) $\frac{9}{39}$ (b) $\frac{25}{62}$

127. Tree diagrams



(b) $\frac{4}{9}$

(c) $\frac{12}{90}$

(d) $\frac{48}{90}$

2 (a) 0.085

(b) 0.19

128. Problem-solving practice 1

- (a) (i) 0.75 (ii) 0.2
(b) 30
- The median height in Park A is greater than the median height in Park B. The range in Park B is greater than in Park A
- (a) $\frac{7}{25}$ (b) $\frac{12}{25}$

129. Problem-solving practice 2

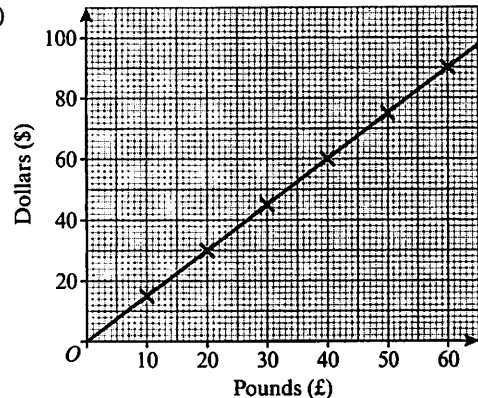
- $\frac{27}{43}$
- 15
- (a) $\frac{31}{80}$ (b) $\frac{17}{28}$

MATHS PRACTICE EXAM PAPER

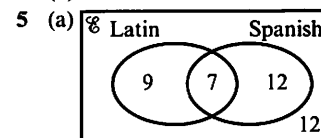
Paper 1

- (a) 9
(b) 36
- | | |
|---|---------------|
| 3 | 9 |
| 4 | 1 3 5 6 9 |
| 5 | 2 3 3 4 6 8 9 |
| 6 | 2 4 5 |

3|9 means 39 mph
- (a) (i) 42° (ii) Alternate angles
(b) 69°
- (a)



(b) £667



(b) $\frac{12}{40} \times 100 = 30\%$

- $x^2 + 3x - 10$
- 9 cm
- 24 sweets