

DGSB Calculator Paper Revision Tips

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The following topics are highly likely to be in the calculator paper. Therefore, make sure that you do the following to be fully prepared for these topics:

1. Work through this exam paper
2. Make notes on each topic.
3. Work through your past papers and circle the questions that test these topics. Then cover up your answers and do them again.
4. Go on mymaths.co.uk (login: DGSB, password: Chord) and work through the examples.

<u>Number</u>	<u>Algebra</u>
Using a calculator efficiently	nth Term Rule
Rounding to significant figure/decimal place	Trial and Improvement
Compound Interest	Generating a formula
Reverse percentage change	Factorising, expanding and simplifying
Product of Prime Factors	Simultaneous Equations
Ratio	Plotting/drawing graphs
Currency conversion	<i>Quadratic Formula</i>
<i>Similar Shapes</i>	
Standard Form	
<i>Proportion</i>	
<u>Shape, Space, Measures</u>	<u>Data Handling</u>
Trigonometry -SOHCAHTOA + sine rule + cosine rule	Estimation of mean from groupd frequency table
<i>Circle Theorems</i>	Moving averages
Circles - area or circumference	Pie Charts
Density	Probability - tree diagrams
Plans and elevations	Frequency Polygon
Bearings	Two Way Tables
Locus and Construction	<i>Stratified Sample</i>
Dimension Theory	Histograms
	Box Plots

1. Use your calculator to find the values of

(a) $\sqrt{10 - \pi}$

(i) Write down all the figures on your calculator.

.....

Answer

(1)

(ii) Give your answer to 3 significant figures.

.....

Answer

(1)

(b) Work out $(3.24 \times 10^{-2}) \div (2.4 \times 10^3)$

Give your answer in standard form.

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Answer

(2)

(Total 4 marks)

2. A special packet of breakfast cereal contains 20% more than a normal packet. The special packet contains 600 g of cereal. How much cereal does the normal packet contain?

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Answer g
(Total 3 marks)

3. James invests £700 for 2 years at 10% per year compound interest. How much interest does he earn?

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Answer £
(Total 2 marks)

4. The table shows the exchange rates between different currencies.

£1 (pound) is worth 1.64 euros
\$1 (dollar) is worth 1.05 euros

(a) Jane changes £400 into euros.
How many euros does she receive?

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Answer euros (2)

(b) Sonia changes 672 euros into dollars.
How many dollars does she receive?

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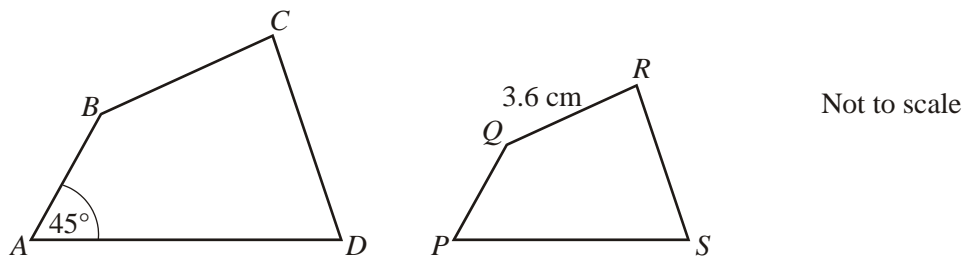
Answer dollars (2)
(Total 4 marks)

5. Mrs Jones inherits £12 000.
She divides the £12 000 between her three children Laura, Mark and Nancy in the ratio
7 : 8 : 9, respectively.
How much does Laura receive?

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Answer £ (Total 2 marks)

6. $PQRS$ is an enlargement of $ABCD$ with scale factor $\frac{2}{3}$
 $QR = 3.6\text{cm}$
 Angle $BAD = 45^\circ$



- (a) Calculate the length of BC .

.....

Answer cm (2)

- (b) Find the size of angle QPS .

.....

Answer degrees (1)
 (Total 3 marks)

7. The area, A square metres, of a new logo is directly proportional to the square of its width, w metres.

The area of the logo is 12 square metres when its width is 4 metres.

- (a) Find an equation connecting A and w .

.....

Answer (3)

- (b) Find the area of a logo with a width of 5 metres.

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Answer m^2 (1)
 (Total 4 marks)

8. A sequence of numbers is shown.

5 9 13 17 21

(a) Find an expression for the n th term of the sequence.

.....
.....

Answer

(2)

(b) Explain why 83 will not be a term in this sequence.

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(2)

(Total 4 marks)

9. Use trial and improvement to find a solution to the equation

$$x^3 - x = 21$$

Give your answer to one decimal place.
You **must** show your working.

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Answer $x =$

(Total 4 marks)

10. A solution of the equation $x^3 - 8x = 110$ lies between $x = 5$ and $x = 6$.

Use trial and improvement to find this solution.
Give your answer to one decimal place.

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Answer $x =$

(Total 3 marks)

11. The students in class 10W measure their hand spans.

- (a) Juan's hand span is x cm.
George's hand span is 1 cm longer.

Write down an expression for George's hand span, in terms of x .

Answer cm (1)

- (b) Vicky's hand span is y cm.
Emma's hand span is 2 cm shorter.

Write down an expression for Emma's hand span, in terms of y .

Answer cm (1)

- (c) Brad's hand span is 18 cm, to the nearest centimetre.

Write down the smallest hand span which rounds to 18 centimetres.

Answer cm (1)
(Total 3 marks)

12. (a) Expand $3(y - 4)$

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Answer

(1)

(b) Simplify the expression

$$2c + 6d + 4c - 8c$$

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Answer

(2)

(c) Factorise $x^2 + 5x$

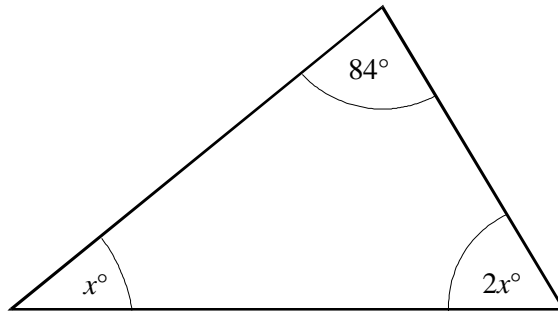
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Answer

(2)

(d) The triangle has angles x° , $2x^\circ$ and 84° as shown.
Find the value of x .



Not drawn accurately

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Answer degrees

(3)

(Total 8 marks)

13. Simplify $\frac{5x^2 + 14x - 3}{x^2 - 9}$

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Answer
 (Total 4 marks)

14. (a) (i) Factorise $x^2 - 7x - 8$

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Answer (2)

(ii) Hence solve the equation $x^2 - 7x - 8 = 0$

.....

Answer (1)

(b) Solve the simultaneous equations

$$\begin{aligned} 5x + 3y &= 13 \\ 3x + 5y &= 3 \end{aligned}$$

You **must** show your working. Do **not** use trial and improvement.

.....

Answer $x = \dots\dots\dots, y = \dots\dots\dots$
 (4)
 (Total 7 marks)

15. Solve the equation

$$x^2 - 10x - 5 = 0$$

Give your answers to 2 decimal places.

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Answer

(Total 3 marks)

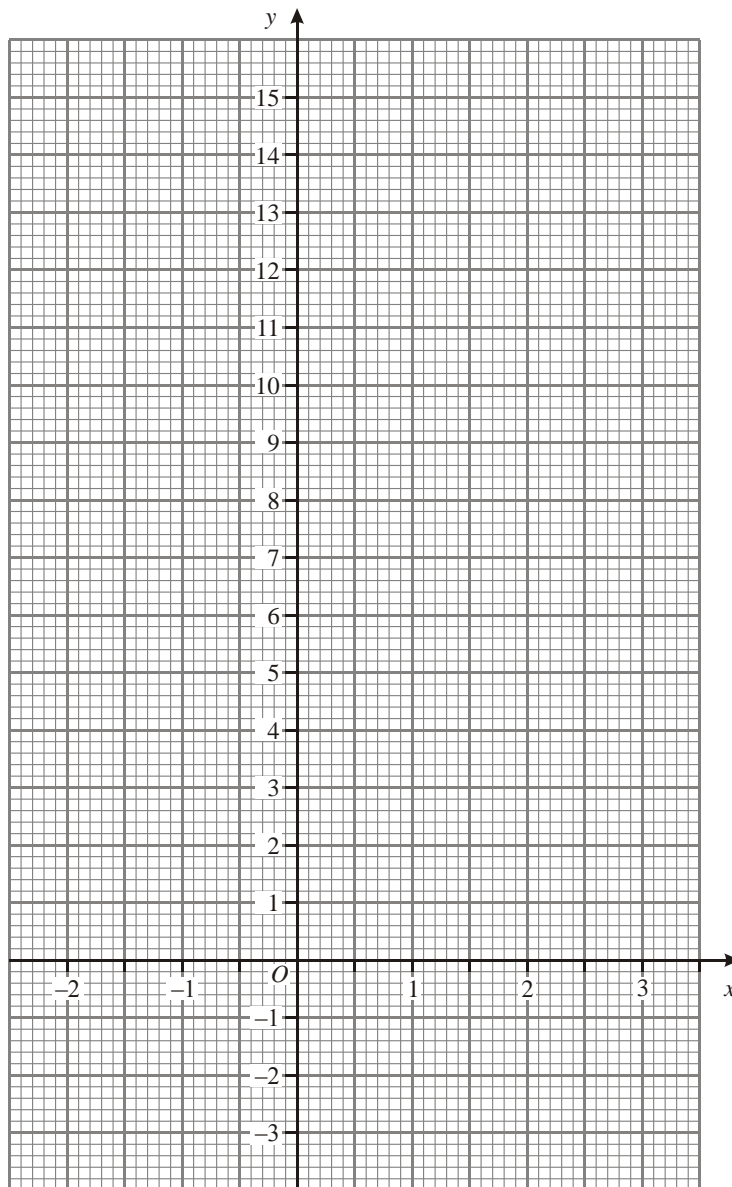
16. (a) Complete the table of values for $y = 2x^2 - 4x - 1$

x	-2	-1	0	1	2	3
y	15		-1		-1	5

.....

(2)

- (b) On the grid, draw the graph of $y = 2x^2 - 4x - 1$ for values of x from -2 to $+3$.



(2)

(c) An approximate solution of the equation $2x^2 - 4x - 1 = 0$ is $x = 2.2$

(i) Explain how you can find this from the graph.

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(1)

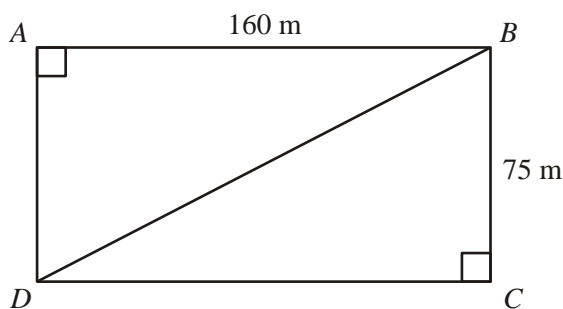
(ii) Use your graph to write down another solution of this equation.

Answer $x =$

(1)

(Total 6 marks)

17. A rectangular field $ABCD$ is shown. The length of the field, $AB = 160$ m.
 The width of the field, $BC = 75$ m.



Not to scale

(a) Calculate the length of the diagonal BD .

Give your answer to a suitable degree of accuracy.

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Answerm

(4)

(b) Calculate the size of angle ADB .

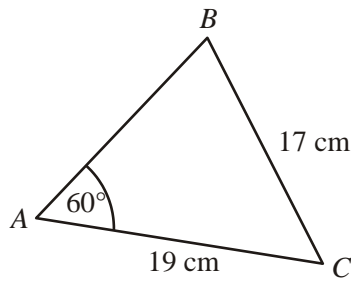
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Answerdegrees

(3)

(Total 7 marks)

18. (a) ABC is a triangle.
 $AC = 19$ cm, $BC = 17$ cm and angle $BAC = 60^\circ$



Not to scale

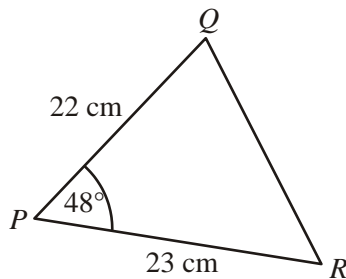
Calculate the size of angle ABC .

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Answer degrees

(3)

- (b) PQR is a triangle.
 $PR = 23$ cm, $PQ = 22$ cm and angle $QPR = 48^\circ$



Not to scale

Calculate the length of QR .
 Give your answer to an appropriate degree of accuracy.

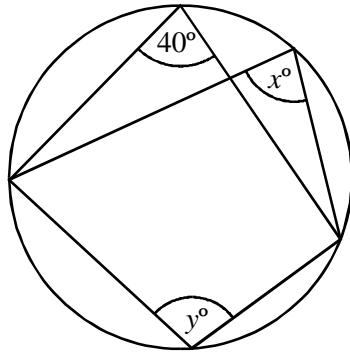
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Answer cm

(4)

(Total 7 marks)

19.



Not drawn accurately

(i) Write down the value of x .

Answer degrees

(1)

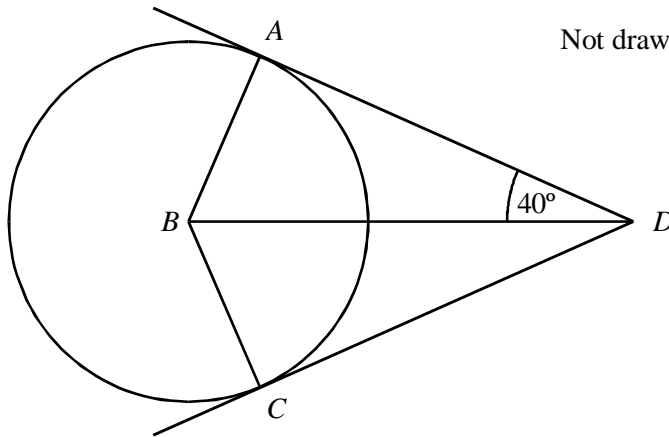
(ii) Calculate the value of y .

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Answer degrees

(1)

(b) A and C are points on the circumference of a circle centre B .
 AD and CD are tangents.
 Angle $ADB = 40^\circ$.



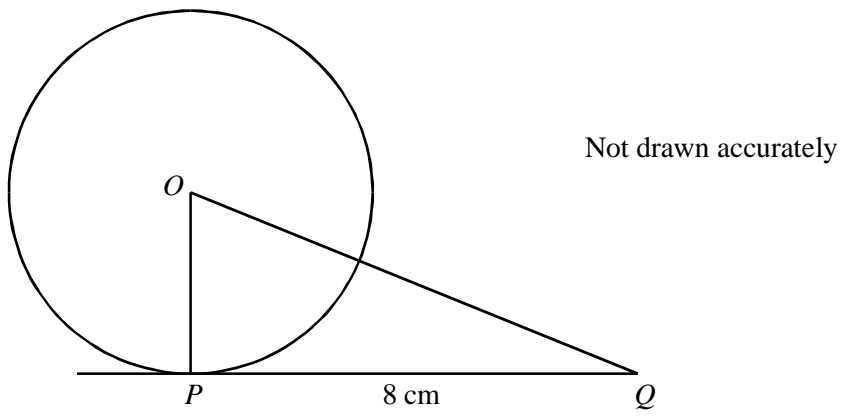
Not drawn accurately

Explain why angle ABC is 100° .

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(2)

- (c) P is a point on the circumference of a circle with centre O .
 PQ is a tangent of length 8 cm.
 The area of triangle OPQ is 24 cm^2 .



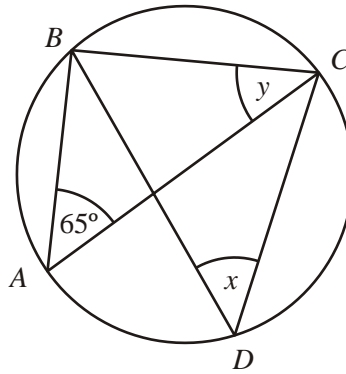
Calculate the area of the circle.
 Give your answer in terms of π .

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Answer cm^2

(3)
 (Total 7 marks)

20. A, B, C and D are points on the circumference of a circle.
 AC is a diameter of the circle.
 Angle $BAC = 65^\circ$



Not drawn accurately

- (a) Write down the value of x .

Answer degrees

(1)

- (b) Calculate the value of y .

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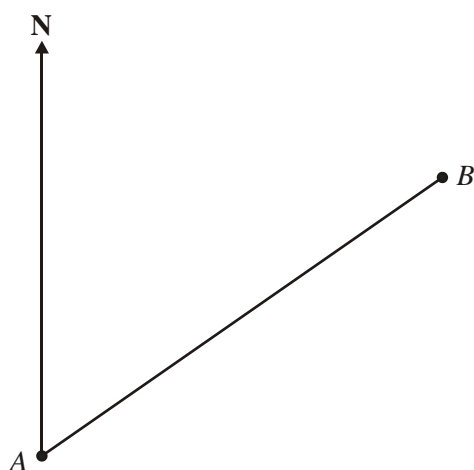
Answer degrees

(1)

(Total 2 marks)

21. The diagram shows a scale drawing of two points, *A* and *B*, on an orienteering course.

Scale: 1 cm represents 50 m



(a) Use the diagram to work out the actual distance from *A* to *B*.

.....

Answer metres

(2)

(b) Measure and write down the three-figure bearing of *B* from *A*.

Answer degrees

(1)

(c) The bearing of point *C* from *A* is 300° . What is the three-figure bearing of *A* from *C*?

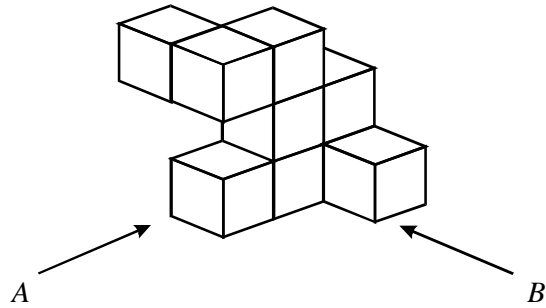
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Answerdegrees

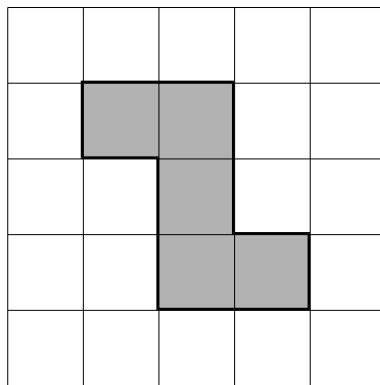
(2)

(Total 5 marks)

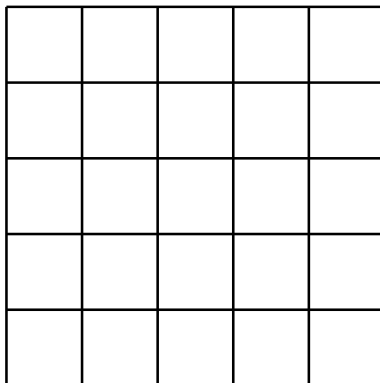
22. The diagram represents a solid made from 9 small cubes.



The view of the solid from direction *A* is shown below.

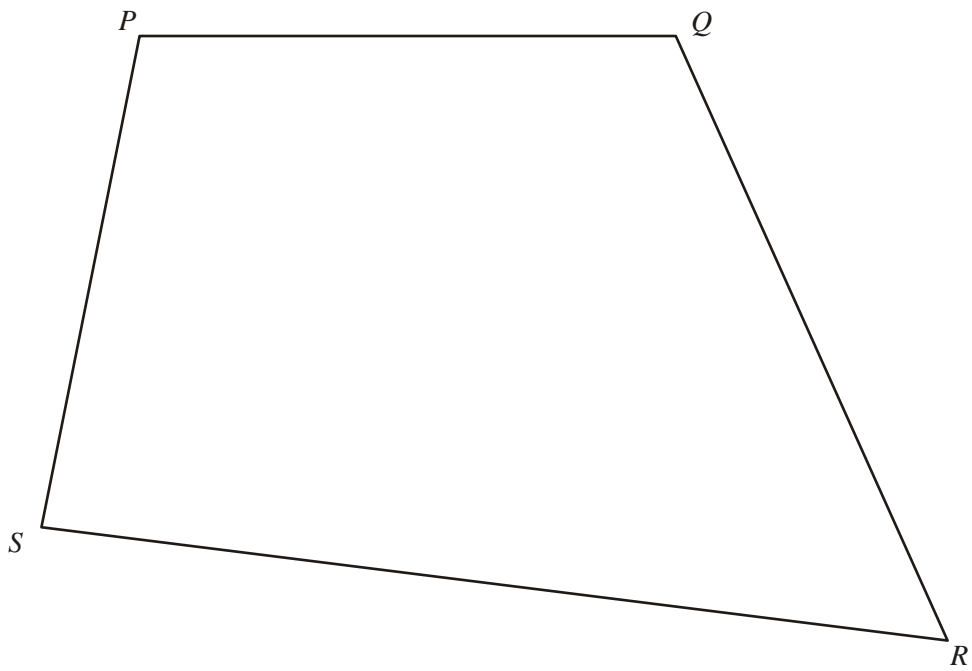


On the grid below, draw the view of the solid from direction *B*.



(Total 2 marks)

23. The diagram shows a quadrilateral $PQRS$.



(a) Draw the locus of points that are the same distance from P as from Q .

(2)

(b) Shade the region inside the quadrilateral which is less than 7 cm from S and nearer to Q than to P .

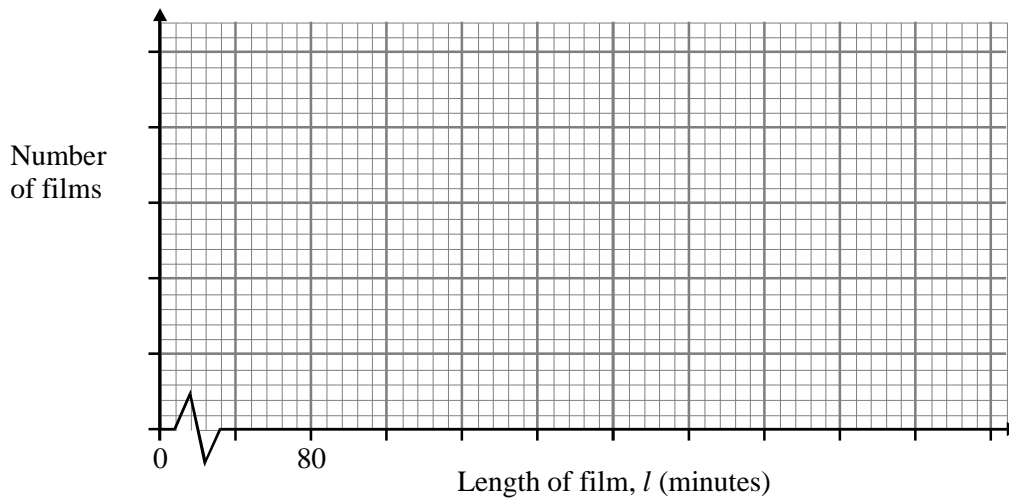
(2)

(Total 4 marks)

24. The table shows the length of some cinema films.

Length, l (minutes)	Number of films
$80 < l \leq 100$	10
$100 < l \leq 120$	3
$120 < l \leq 140$	6
$140 < l \leq 160$	1

(a) Use this information to draw a frequency diagram.



(3)

(b) Calculate an estimate of the mean length of these 20 films.

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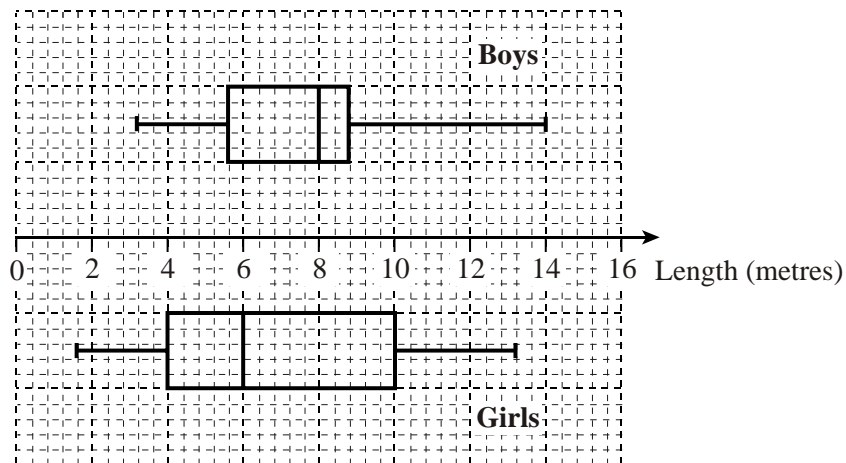
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Answer minutes

(4)

(Total 7 marks)

25. The box plots show the lengths jumped by 50 boys and the lengths jumped by 50 girls in the triple jump.



- (a) What is the median length jumped by the girls?

Answer

(1)

- (b) Give **two** differences between the lengths jumped by the boys and the lengths jumped by the girls.

1st difference

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.....

2nd difference

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.....

(2)

(Total 3 marks)

26. The table shows Emma's spelling test scores for 8 weeks.

Week	1	2	3	4	5	6	7	8
Score	5	6	6	6	7	6	6	7

Emma's first two 5-point moving average scores are shown in this table.

Week	1	2	3	4	5	6	7	8
Score	5	6	6	6	7	6	6	7
5-point moving average			6.0	6.2				

Complete the table to show **all** the possible 5-point moving average scores.
You **must** show your working.

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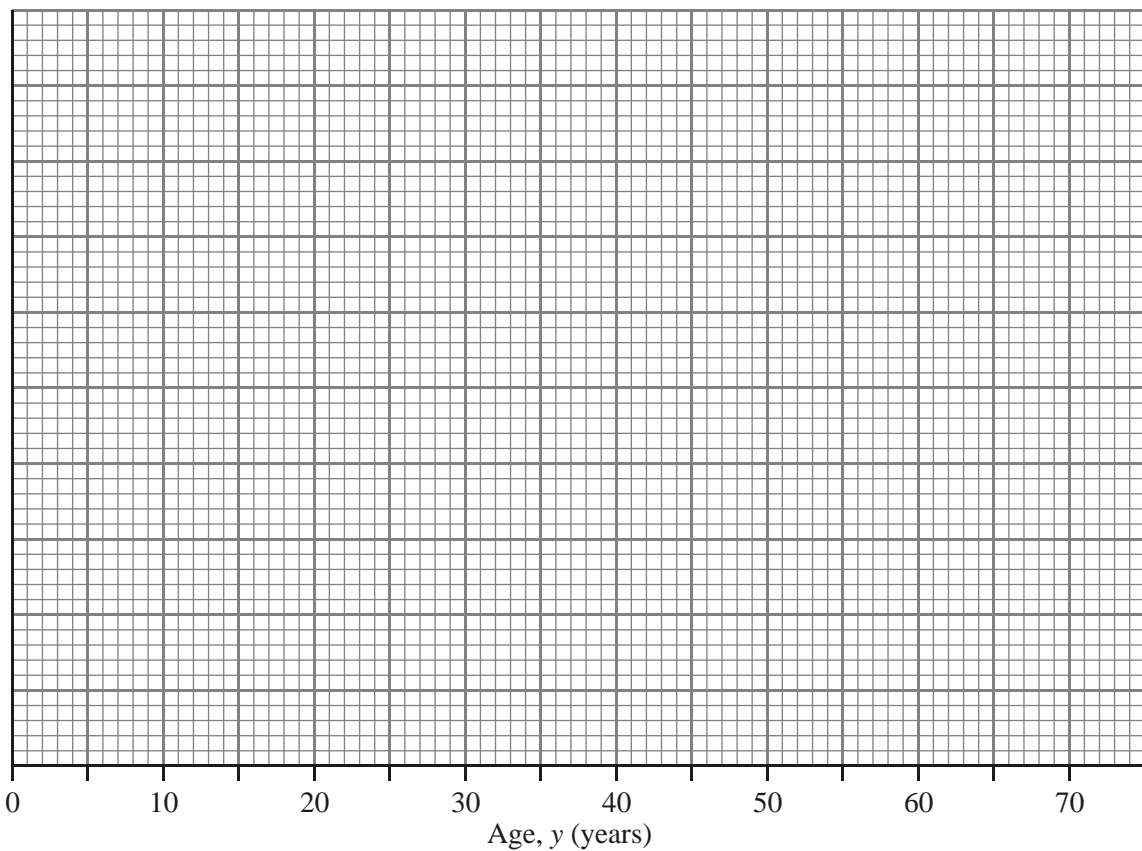
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(Total 3 marks)

27. The table shows the distribution of ages in a health club.

Age, y (years)	Frequency
$0 < y \leq 15$	75
$15 < y \leq 20$	350
$20 < y \leq 25$	850
$25 < y \leq 40$	750
$40 < y \leq 70$	600

(a) (i) Draw a histogram to illustrate this data.



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(3)

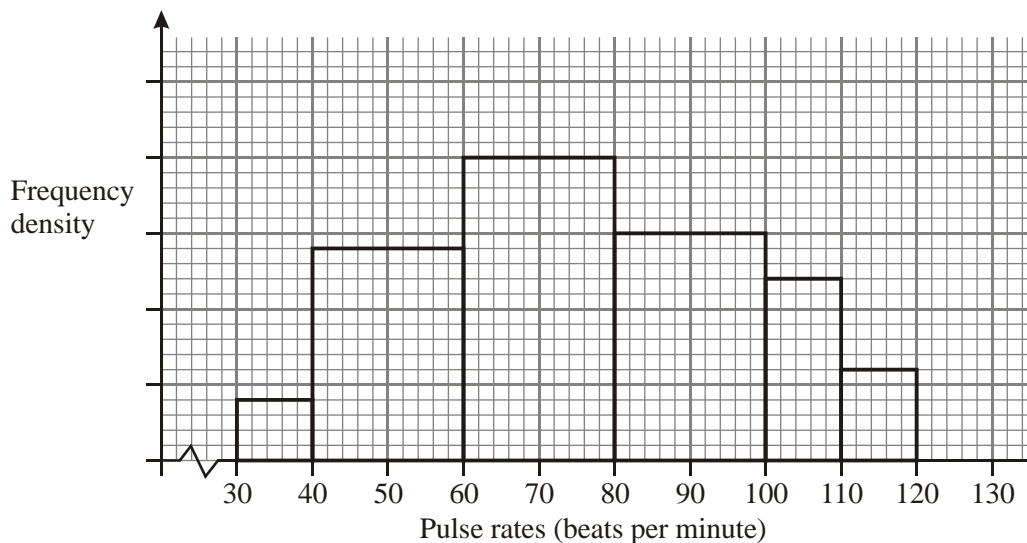
(ii) Members over 65 pay a reduced subscription. Estimate how many members are over 65.

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Answer

(1)

(b) This histogram shows the pulse rates of some of the members of the club.



60 of the members have a pulse rate lower than 50 beats per minute.
 How many members have a pulse rate greater than 90 beats per minute?

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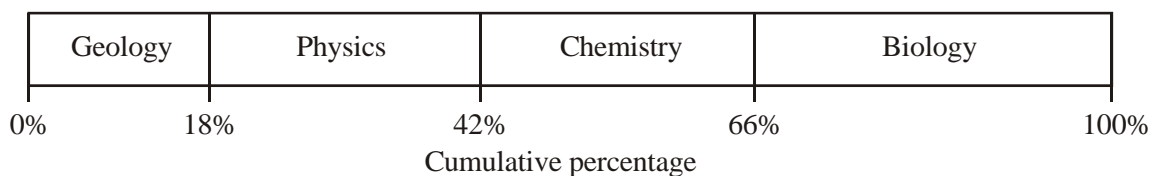
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Answer

(4)
 (Total 8 marks)

28. The government wants to survey students studying science at university about their views on becoming teachers.
 They decide to survey science students at Surrey University.
 2371 students do science at Surrey University.

The cumulative percentage table of students doing each science is



- (a) The government decide to do a 10% stratified sample.
 Write down the numbers from each category that they should sample.

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Geology	Physics	Chemistry	Biology

(3)

- (b) Give one other factor they should take into account when selecting the sample to ensure an unbiased sample.

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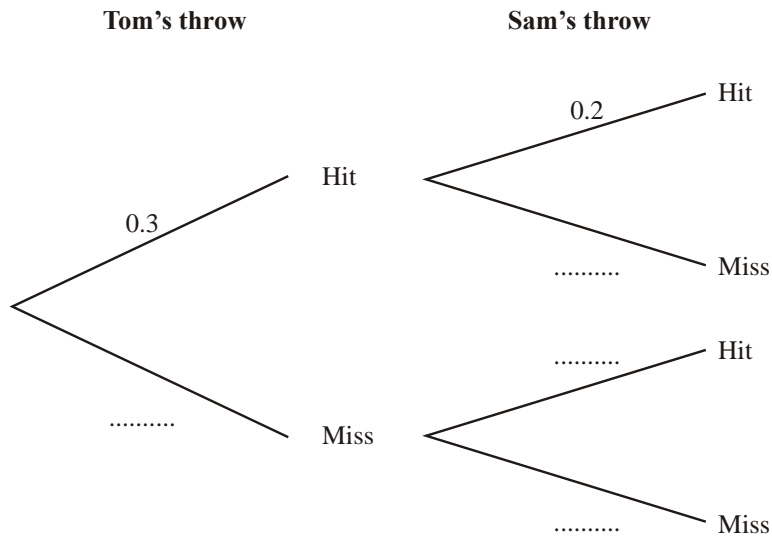
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(1)

(Total 4 marks)

29. Tom and Sam take turns to throw a dart at a target.
 The probability that Tom hits the target is 0.3. The probability that Sam hits the target is 0.2

(a) Complete the tree diagram.



(1)

(b) What is the probability that Tom and Sam both hit the target?

.....

Answer

(2)

(Total 3 marks)

30. Shaz has ten one pound coins.
 Six have a thistle design and four have a leek design.



She chooses a one pound coin at random.

If the first coin has a thistle design she replaces it, and chooses again.

If the first coin has a leek design she does not replace it, but chooses again.

What is the probability that the second coin has a leek design?

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Answer

(Total 4 marks)

31. Billy asks 40 students how they travel to college.

The table shows the results.

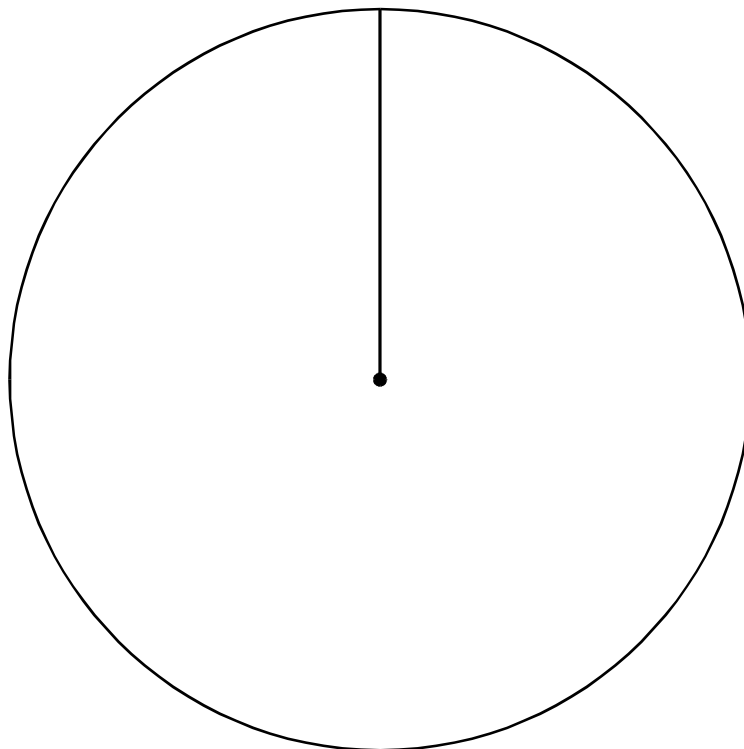
Method of travel	Frequency
Car	20
Bus	10
Walk	6
Other	4

(a) Draw and label a pie chart to represent the information in the table.

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(4)

(b) Explain why Billy's results may not show the correct proportions for the whole college.

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(1)

(Total 5 marks)