



General Certificate of Secondary Education
2018

Centre Number

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Candidate Number

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Mathematics

Unit T2
(With calculator)
Foundation Tier



[GMT21]

GMT21

THURSDAY 24 MAY, 9.15am–10.45am

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all thirty** questions.

All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.

You **may** use a calculator for this paper.

INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Functional Elements will be assessed in this paper.

Quality of written communication will be assessed in Question 9.

You should have a calculator, ruler, compasses and a protractor.

The Formula Sheet is on page 2.

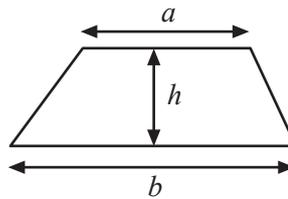
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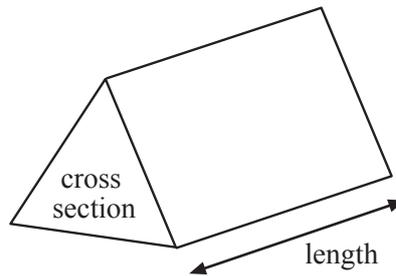
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Formula Sheet

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = area of cross section \times length





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32GMT2103

- 1 Patrick invested £5600 for 4 years at 2% per annum simple interest.

Work out the interest that Patrick earned.

Answer £ _____ [3]

- 2 (a) Calculate $0.7^2 + \sqrt{5.76}$

Answer _____ [1]

- (b) Without using a calculator, show how to work out the value of $7^3 \times 10^2$

Answer _____ [2]



3 Paula paid £175 for 50 pens.

She sold 60% of them at £4 each.

She then reduced the price by £1.50 each and sold the rest.

Did she make a profit or loss?

How much was this profit or loss?

Answer _____ of £ _____ [6]

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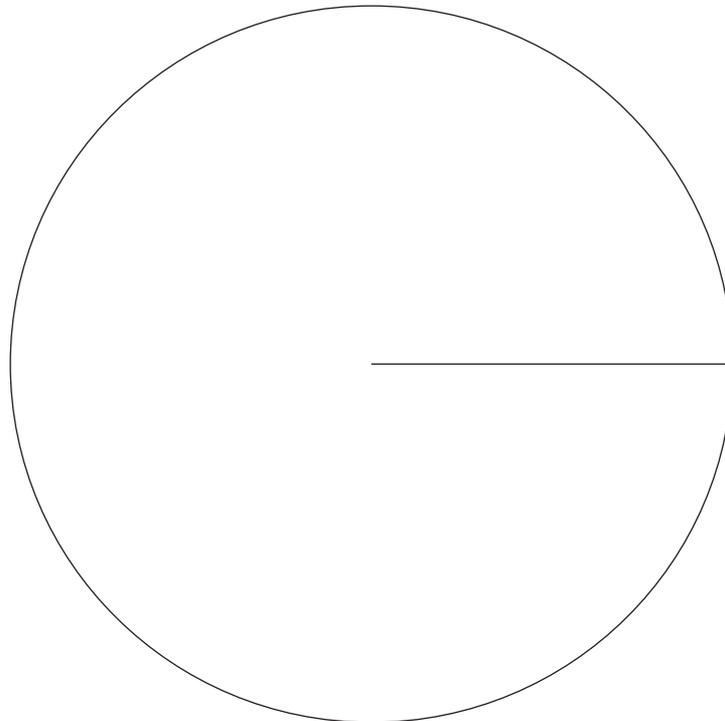
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4 120 people work for an I.T. company.

The table below shows how they get to work.

Car	56
Walk	21
Bus	35
Train	8

Draw a pie chart below to show this data.



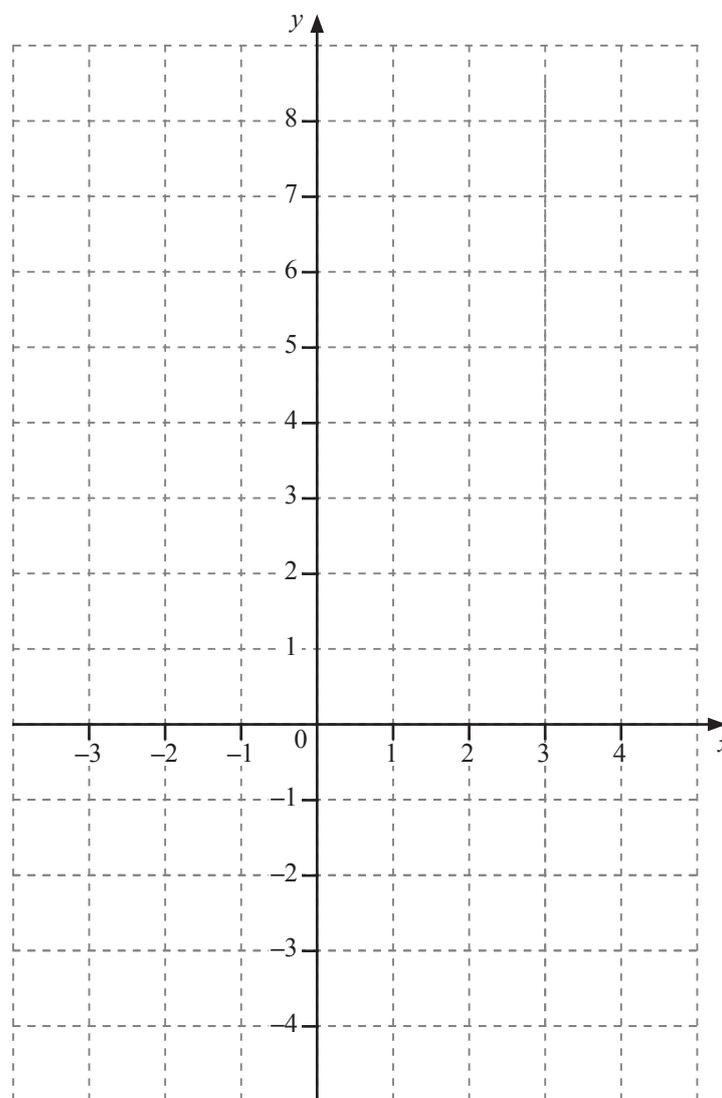
[4]



5 Complete the table below for $y = 3 - 2x$

x	-2	-1	0	1	2	3
y	7		3	1		-3

Draw the graph of $y = 3 - 2x$ on the grid below.



[3]

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6 Last year, Conor spent $\frac{3}{10}$ of his salary on rent, $\frac{2}{5}$ of his salary on socialising and $\frac{1}{4}$ of his salary on food.

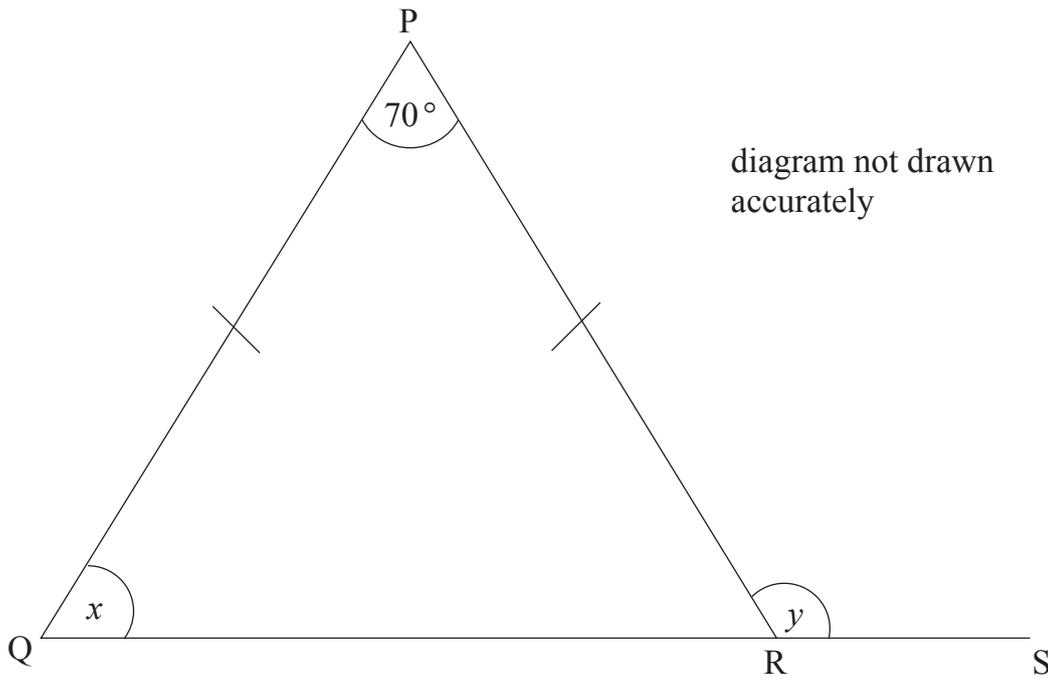
He saved the rest of his salary.

What fraction of his salary did he save?

Answer _____ [4]



7



PQR is an isosceles triangle with $PQ = PR$.
QRS is a straight line.

(a) Work out the size of the angle marked x .

Answer _____ ° [2]

(b) Work out the size of the angle marked y .

Answer _____ ° [1]

[Turn over

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32GMT2109

- 8 The life expectancy for males in 12 countries in Africa for 2015 is shown in the following stem and leaf diagram.



Key: 5 | 3 means 53 years

- (a) How many of these countries had a life expectancy for males of less than 58 years?

Answer _____ [1]

- (b) For the above data work out

- (i) the median,

Answer _____ years [1]

- (ii) the range.

Answer _____ years [1]



(c) In **1975** the life expectancy for males in the same 12 countries had a median of 49 years and a range of 30 years.

Compare the life expectancy for males in these 12 countries in **2015** with the life expectancy for males in **1975**

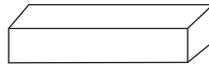
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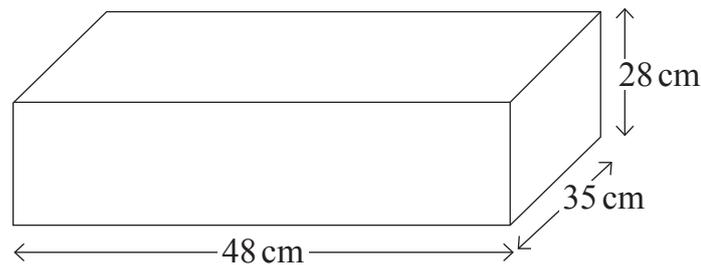
Quality of written communication will be assessed in this question.

- 9 The packaging for a tube of toothpaste is a cuboid measuring $16\text{ cm} \times 5\text{ cm} \times 4\text{ cm}$.



The manufacturer wants to be able to pack 150 of these tubes into a cardboard box. The box is a cuboid.

The box measures $48\text{ cm} \times 35\text{ cm} \times 28\text{ cm}$.



Will the box be big enough to hold 150 tubes of toothpaste in their packaging?
You must show working to explain your answer.

Answer _____ [3]



10 (a) Simplify $7c - 3d - 2c + 2d$

Answer _____ [2]

(b) Work out the value of $3e + 4$ when $e = -5$

Answer _____ [2]

11 There are 1200 pupils in a school.

228 of these pupils are in Year 12

What percentage of pupils in the school are in Year 12?

Answer _____ % [2]

[Turn over

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32GMT2113

12 Write down what $0.\dot{8}2\dot{3}$ means.

Answer _____ [1]



13 Emma carries out an investigation into the cost of food at her school canteen.

She asks a sample of pupils in the queue for the canteen the following question:

“Do you agree that school dinners are value for money?”

(a) Why is her sample of pupils likely to be biased?

Answer _____ [1]

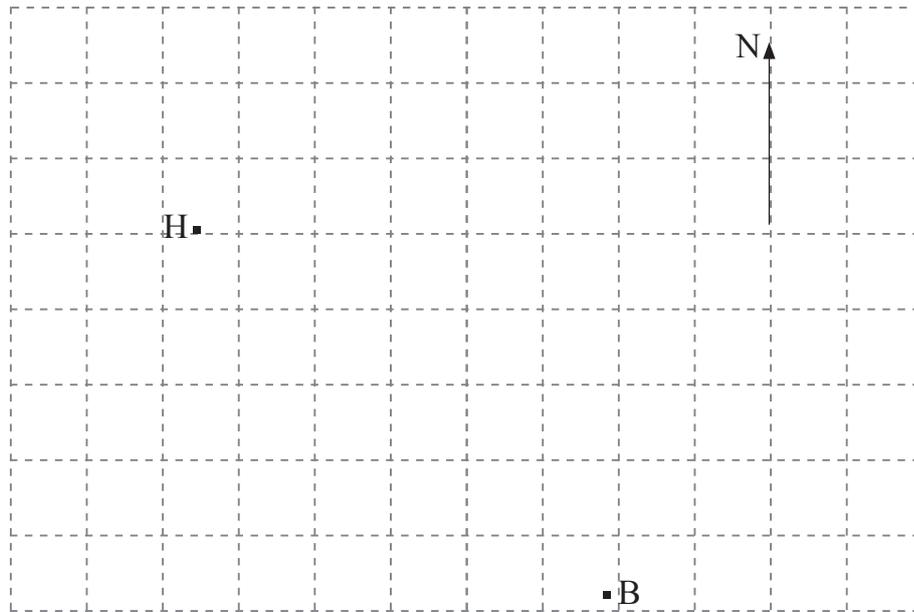
(b) Why is her question biased?

Answer _____ [1]

[Turn over



14



The diagram shows the position of a harbour (H) and a fishing boat (B).

Find the bearing of the harbour from the fishing boat.

Answer _____ ° [1]



15 John has a telephone with the following costs.

Line rental: £18.99 per month

Call charge: 5.8p per minute

Last month John made calls lasting 385 minutes.

Work out his telephone bill for last month.

Answer £ _____ [3]

16 (a) Factorise fully

(i) $12 - 8a$

Answer _____ [1]

(ii) $3b^2 - b$

Answer _____ [1]

(b) Solve $6x - 7 = 2x + 11$

Answer $x =$ _____ [3]

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17

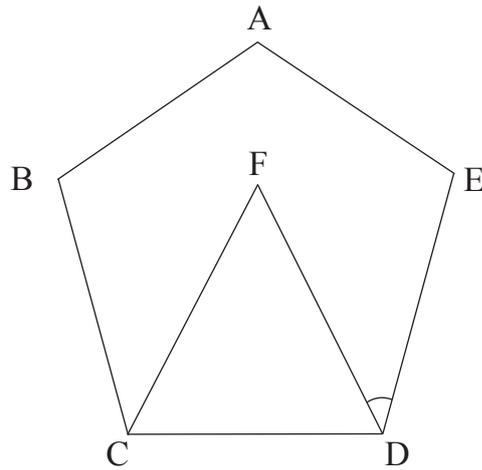


diagram not
drawn accurately

ABCDE is a regular pentagon.

CDF is an equilateral triangle.

Calculate the size of angle FDE.

Answer _____ ° [4]



18

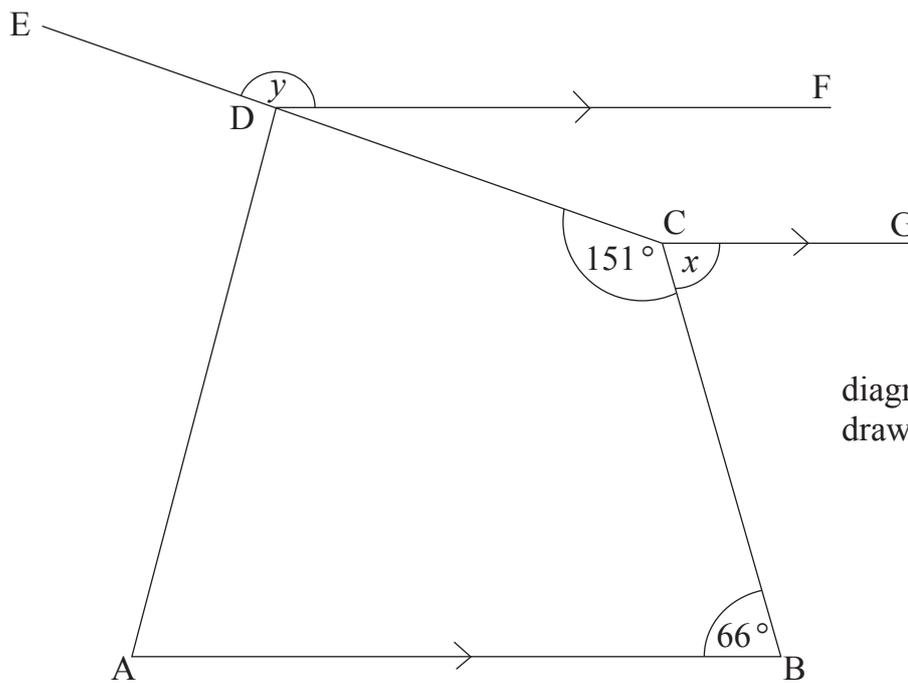


diagram not
drawn accurately

EDC is a straight line.

DF, CG and AB are all parallel.

(a) (i) Write down the size of the angle marked x

Answer $x =$ _____ $^{\circ}$ [1]

(ii) Give a reason for your answer.

_____ [1]

(b) Work out the size of the angle marked y

Answer $y =$ _____ $^{\circ}$ [2]

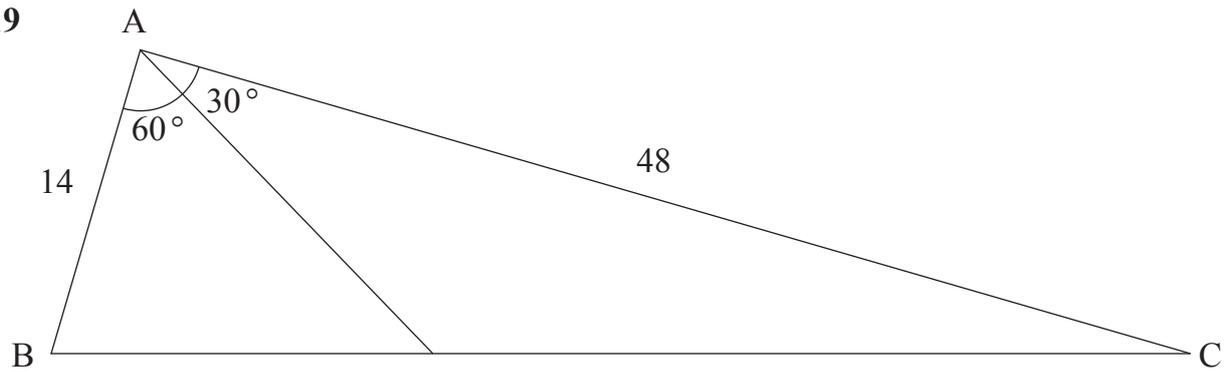
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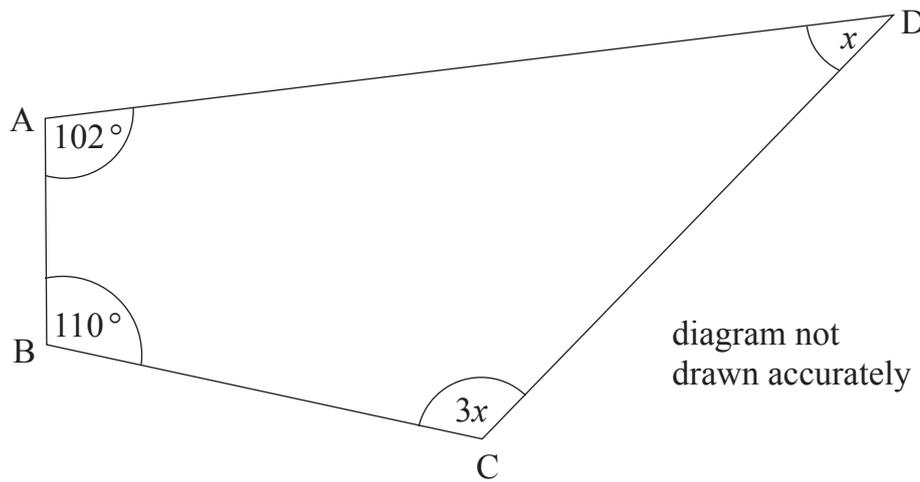


Calculate the length of the straight line BC.

Answer _____ [3]



20



ABCD is a quadrilateral.

Work out the size of the **largest** angle in the quadrilateral.

Answer _____ ° [4]

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21

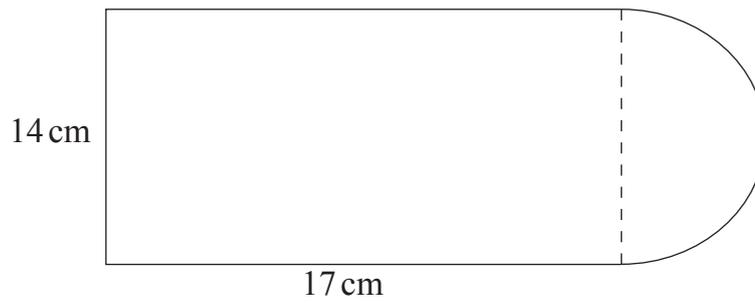


diagram not
drawn accurately

This shape is made up of a rectangle and a semicircle.

The length of the rectangle is 17 cm and its breadth is 14 cm.

Calculate the perimeter of the shape.

Answer _____ cm [3]



22 The first five terms of a sequence are 2, 6, 10, 14, 18,

(a) Write down an expression for the n^{th} term of this sequence.

Answer n^{th} term = _____ [2]

(b) Which term of this sequence will equal 130?

Answer _____ [2]

23 Solve the equation $p + 15 = 2(4p - 3)$

Answer $p =$ _____ [3]

[Turn over



24 Expand and simplify $x(x - y) + y(x - 2)$

Answer _____ [3]

25 A solution to the equation $4x^2 - x = 41$ lies between $x = 3$ and $x = 4$

Use trial and improvement to find a more accurate solution for this equation, correct to 1 decimal place.

Show all your working clearly.

x	$4x^2 - x$

Answer $x =$ _____ [3]



26 At a concert 40% of the audience are children.
One third of the rest of the audience are men.
There are 120 women in the audience.

Work out the total number of people in the audience.

Answer _____ [3]



- 27 Amy recorded the times, in seconds, that customers spent in a queue at a supermarket checkout.

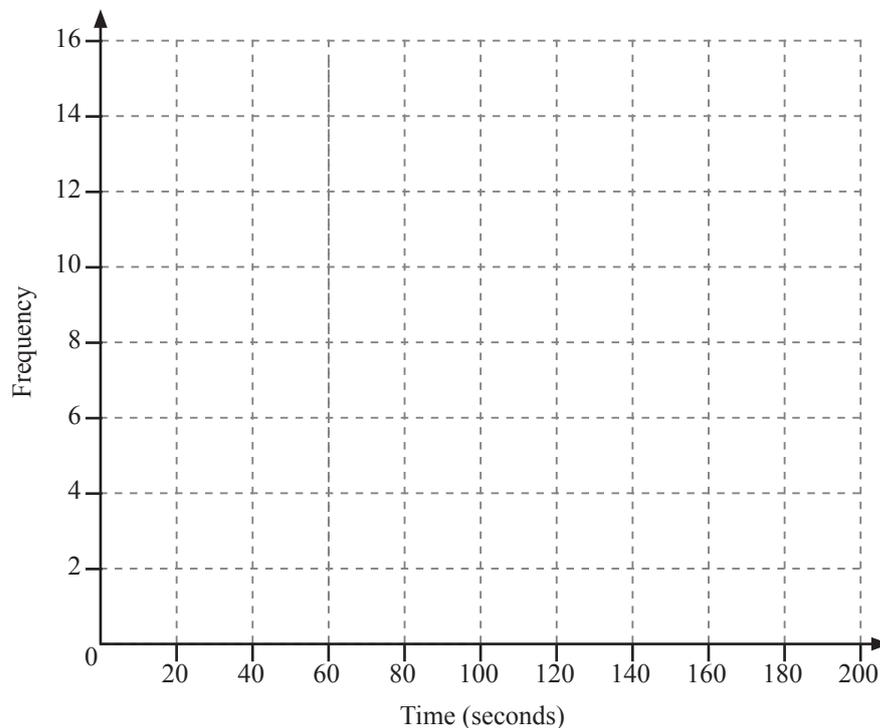
The data is shown in the table below.

Time (t seconds)	Frequency
$0 < t \leq 40$	4
$40 < t \leq 80$	14
$80 < t \leq 120$	10
$120 < t \leq 160$	16
$160 < t \leq 200$	6

- (a) What is the modal class for the data?

Answer _____ [1]

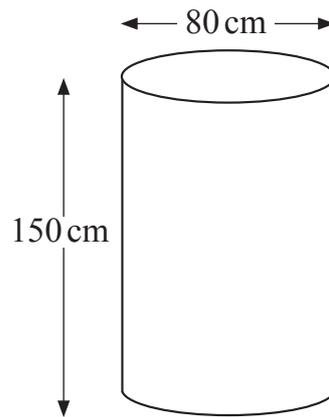
- (b) Draw a frequency polygon for the data on the grid below.



[2]



28 A cylindrical tank has a diameter of 80 cm and a height of 150 cm as shown.



Calculate the volume of water the tank can hold when full.

Give your answer correct to the nearest litre.

Answer _____ litres [4]



29 Peter, John and Matthew are three brothers.

Peter is 10 years old.

John is x years old.

Matthew is a year younger than twice John's age.

The mean of their ages is 7 years.

Work out John's age.

Answer _____ [4]



30 Which average (mean, mode or median) would be most suitable for each set of data?

Explain your choice.

(a) The data is not numerical.

Answer _____ because _____
_____ [1]

(b) The data is fairly evenly spread but there is one extreme value at the upper end.

Answer _____ because _____
_____ [1]

(c) One value appears much more frequently than the others and it is not at the upper or lower end of the data.

Answer _____ because _____
_____ [1]

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