Please check the examination details below before entering your candidate information

Candidate surname	Other names

Centre Number | Candidate Number

Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Time 1 hour 30 minutes

Paper reference **1MA1/2H**

Mathematics

PAPER 2 (Calculator)
Higher Tier
Mock set 7

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used**.
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Find the value of the reciprocal of $\frac{2}{9}$

.....

(Total for Question 1 is 1 mark)

2 (a) Write 152 as a product of its prime factors.

.....

(2)

(b) Find the highest common factor (HCF) of 96 and 152

.....

(2)

(Total for Question 2 is 4 marks)

3 x is an integer such that $5x > 38$

(a) Find the least value of x.

.....

(2)

(b) Solve $3p - 7 = 5p + 10$

$p =$ .....

(2)

Tammy has been asked to solve the equation $16h^2 = 400$

Here is her working.

$\sqrt{400} = 20$

$20 \div 16 = 1.25$

Tammy's answer is wrong.

(c) Describe a mistake Tammy has made.

.....

.....

.....

(1)

(Total for Question 3 is 5 marks)

4 Sandro plans to travel to work by train on 20 days next month.

He can buy
a monthly ticket costing £262
or 20 separate tickets costing £15.70 each ticket.

What percentage of the total cost of 20 separate tickets does Sandro save by buying a monthly ticket?
Give your answer correct to 1 decimal place.

.....%

(Total for Question 4 is 3 marks)

5 (a) Write 174 million in standard form.

.....

(2)

Mark is going to put some paper in his printer.

Each sheet of paper is 8.5×10^{-3} cm thick.
The paper tray of Mark's printer has a depth of 30 mm.

(b) Show that Mark can fit more than 350 sheets of paper in the tray.

(2)

(Total for Question 5 is 4 marks)

6 The table shows the probabilities that a biased dice will land on 1, on 2, on 3, on 4, on 5 and on 6

Number on dice	1	2	3	4	5	6
Probability	0.06	0.15	0.32	0.1	0.24	0.13

Sven rolls the biased dice 400 times.

Work out an estimate for the number of times the dice will land on 2 or on 5

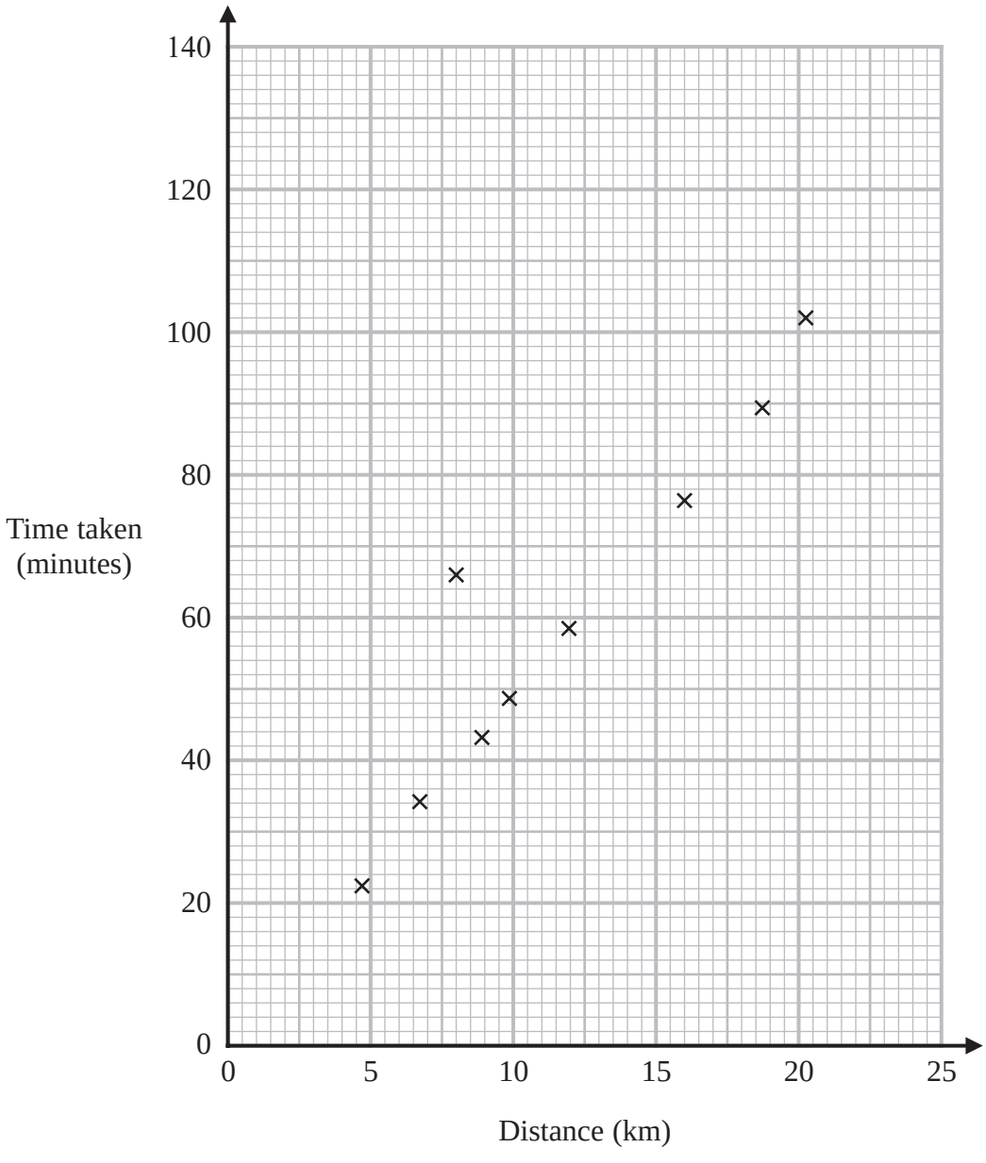
.....

(Total for Question 6 is 2 marks)

7 Giles is training to take part in a long distance run.
For each training session, he records the distance he ran and the time taken to run that distance.

Giles tries to run at the same speed in each session.

The scatter graph shows information about his results.



On one of Giles' training sessions, he ran at a slower speed than on his other training sessions.

(a) (i) Explain how this can be seen from the scatter graph.

.....

.....

.....

(1)

(ii) On this training session, what distance did Giles run?

..... km

(1)

Ignoring the training session in part (a), the equation of the line of best fit for the other eight results is

$y = 4.6x + 9$ where y minutes is the time taken for Giles to run x km.

(b) (i) Write down the gradient of the line of best fit.

.....

(1)

(ii) In the table below, put a tick (✓) in the box next to the sentence that describes what the gradient represents.

Giles runs 1 km in 9 minutes	
Giles runs 9 km in 4.6 minutes	
Giles runs 1 km in 4.6 minutes	
Giles runs 4.6 km in 9 minutes	
Giles runs 9 km in 1 minute	
Giles runs 4.6 km in 1 minute	

(1)

(Total for Question 7 is 4 marks)

8 Anaya and Leon each bought a ticket to fly to Poland.
They bought the tickets from different travel companies.

The price of the ticket Anaya bought was $\frac{1}{3}$ less than the normal price of the ticket.
The price that Anaya paid for her ticket was £135

The price of the ticket Leon bought was 40% less than the normal price of the ticket.
The price that Leon paid for his ticket was £126

Anaya says that the normal price of her ticket was less than the normal price of Leon's ticket.

Is Anaya correct?
You must show how you get your answer.

(Total for Question 8 is 4 marks)

9 Alan owns a shop.
One week he recorded the number of orders placed each day.

For Monday to Friday, the mean number of orders placed per day was 72
For the whole week, the mean number of orders placed per day was 93

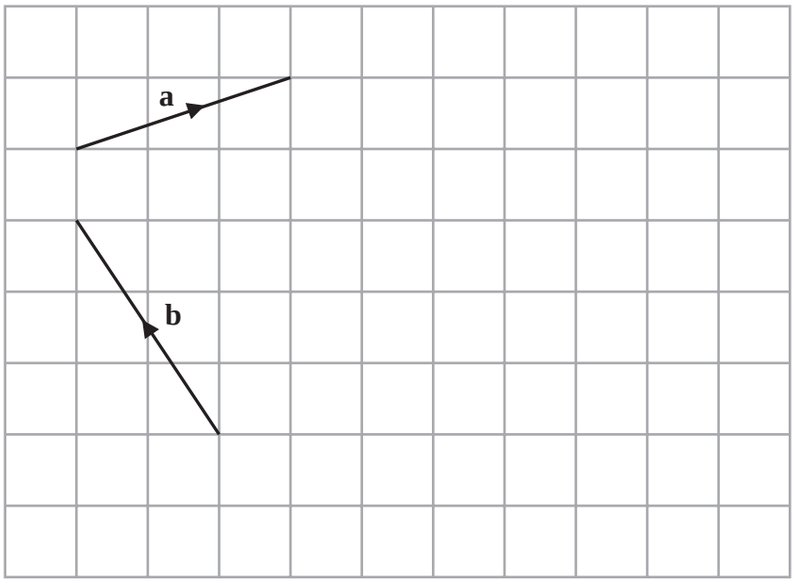
On Saturday, 152 orders were placed.

Work out the number of orders placed on Sunday.

.....

(Total for Question 9 is 3 marks)

10 The vector **a** and the vector **b** are shown on the grid.



(a) On the grid, draw and label the vector **a** – **b**

(1)

p and **q** are vectors such that

$$\mathbf{p} = \begin{pmatrix} 3 \\ c \end{pmatrix} \text{ and } \mathbf{q} = \begin{pmatrix} d \\ -2 \end{pmatrix}$$

Given that $2\mathbf{p} - 3\mathbf{q} = \begin{pmatrix} -9 \\ 14 \end{pmatrix}$

(b) find the value of c and the value of d.

$c =$ .....

$d =$ .....

(3)

(Total for Question 10 is 4 marks)

11 Stanley invests £7500 for 4 years in a savings account.
The savings account pays compound interest at a rate of x% per year.

At the end of 4 years the investment is worth £7866.53

Work out the value of x.
Give your answer correct to 1 decimal place.

$x =$ .....

(Total for Question 11 is 3 marks)

12 (a) Make w the subject of $u = \frac{w^2}{4} + 2t$

.....

(3)

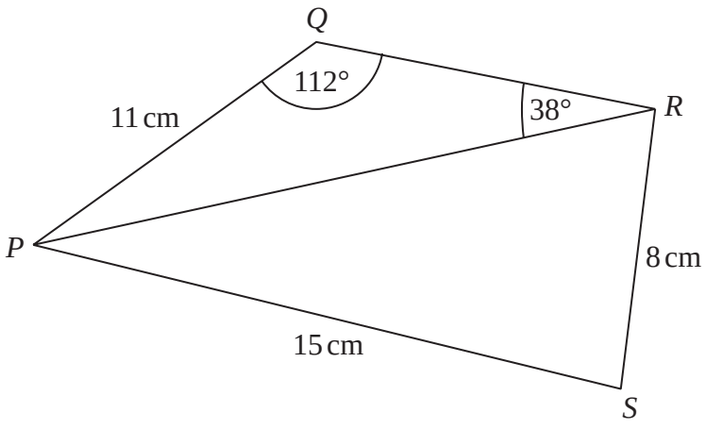
(b) Factorise fully $3y^2 - 147$

.....

(2)

(Total for Question 12 is 5 marks)

13 *PQR* and *PRS* are triangles.



Calculate the size of angle *PSR*.
Give your answer correct to 1 decimal place.

.....°

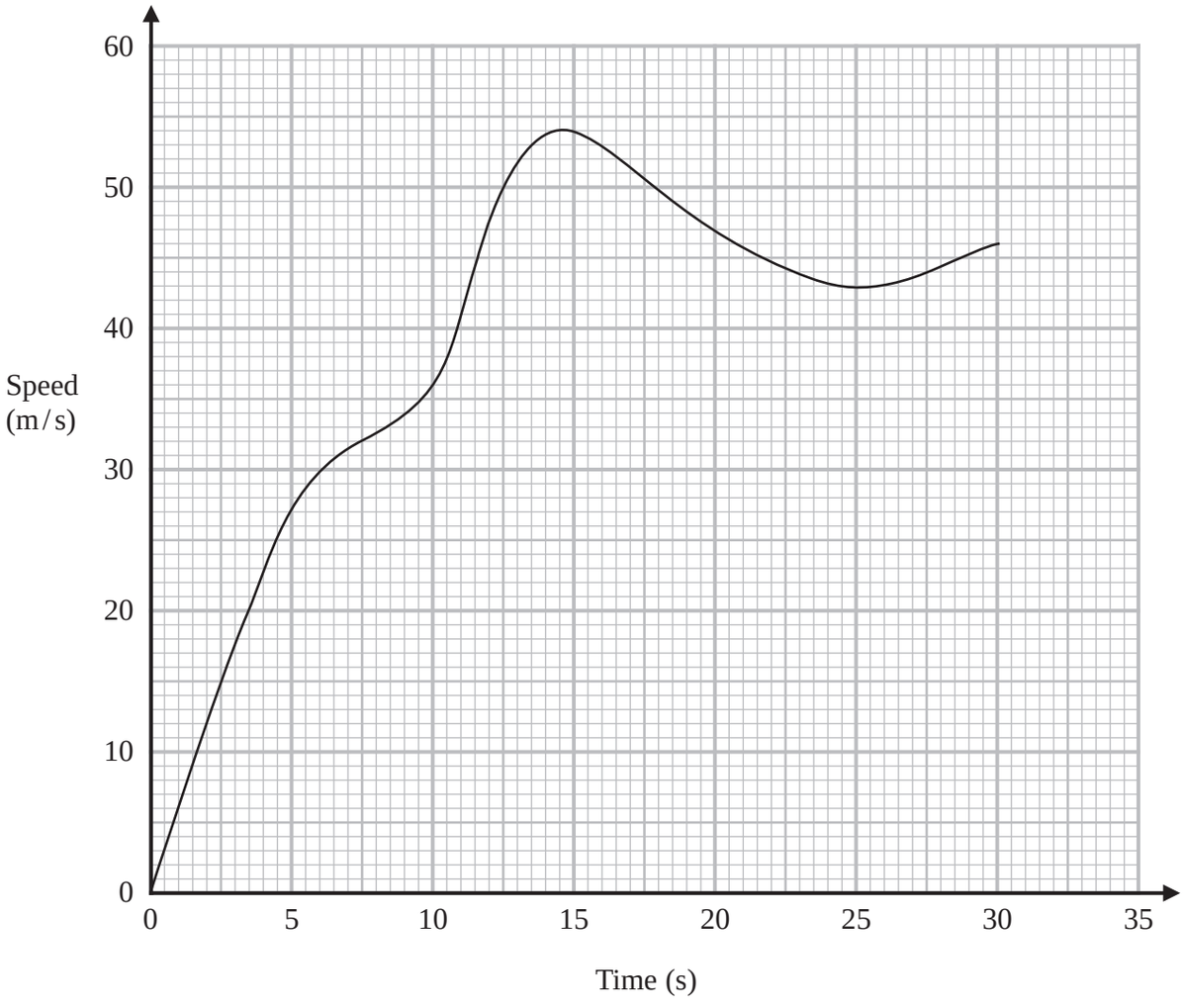
(Total for Question 13 is 5 marks)

14 Expand and simplify $(6x + 3)(2x - 5)(7 - 4x)$

.....

(Total for Question 14 is 3 marks)

15 Here is the speed-time graph of a racing car for the first 30 seconds of a race.



(a) Work out an estimate for the acceleration, in m/s^2, of the racing car 10 seconds after the start of the race.
You must show how you get your answer.

..... m/s^2

(3)

(b) Work out an estimate for the distance travelled by the racing car in the first 15 seconds of the race.
Use 3 strips of equal width.

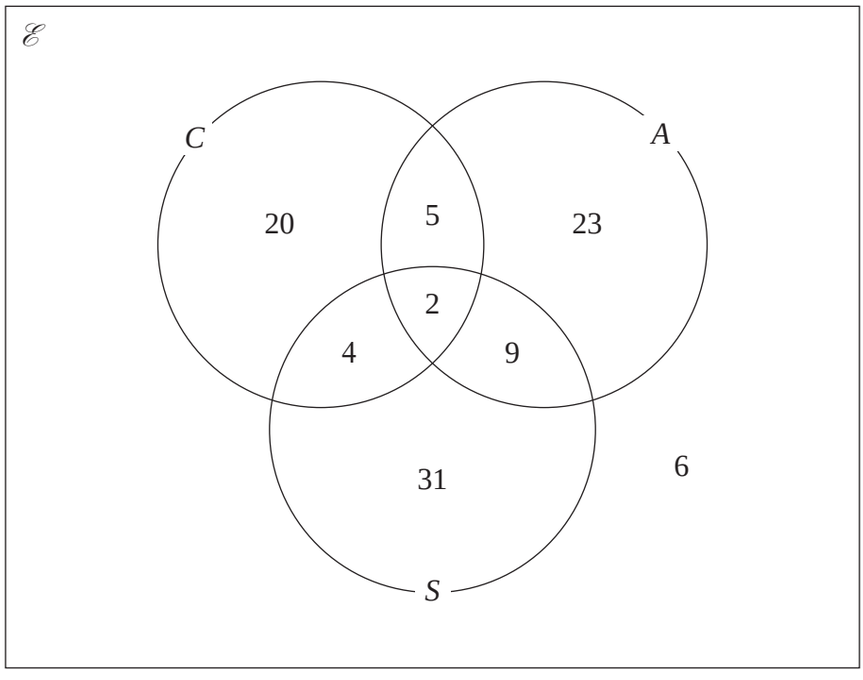
..... m

(3)

(Total for Question 15 is 6 marks)

16 Sami asked 100 people which types of film they liked from comedy (C), action (A) and science fiction (S).

The Venn diagram shows information about her results.



One of the people that Sami asked is chosen at random.

Given that the person likes science fiction, find the probability that this person also likes exactly one other type of film.

.....

(Total for Question 16 is 2 marks)

17 At a height of n metres above sea level, the atmospheric pressure is P_n millibars.
At a height of $(n + 1000)$ metres above sea level, the atmospheric pressure is $P_{(n + 1000)}$ millibars

where $P_{(n + 1000)} = 0.88 P_n$

At sea level, the atmospheric pressure is 1013 millibars.

Calculate the atmospheric pressure at a height of 3000 metres above sea level.
Give your answer correct to 3 significant figures.

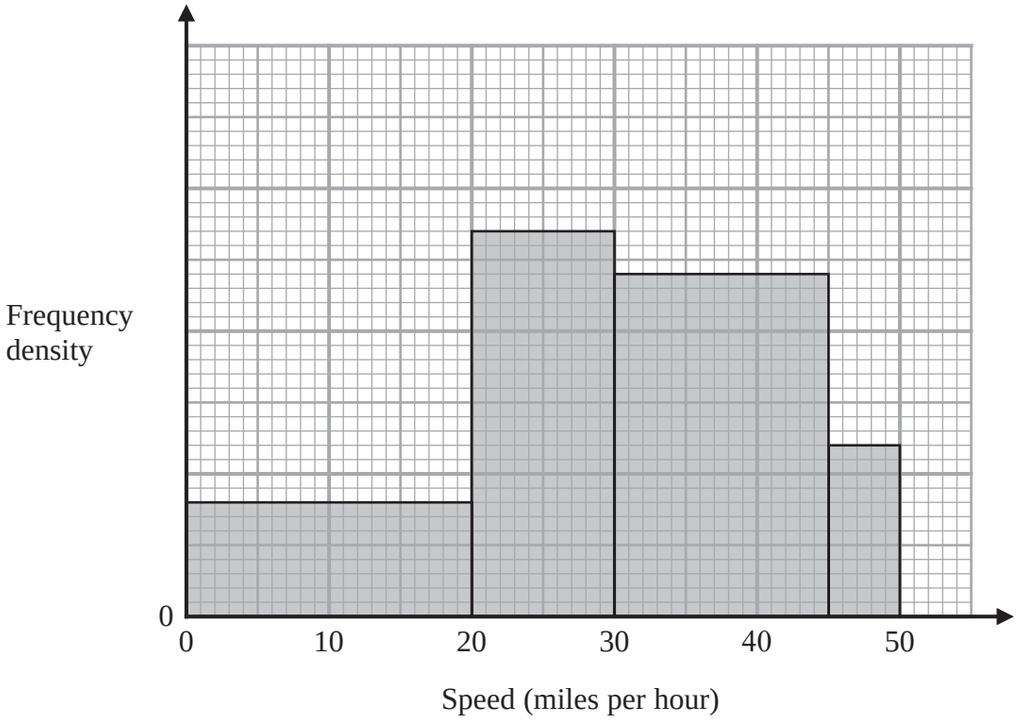
..... millibars

(Total for Question 17 is 3 marks)

18 Show that $\dfrac{1}{12^{-\frac{3}{2}}}$ can be written in the form $a\sqrt{b}$ where a is an integer and b is a prime number.

(Total for Question 18 is 3 marks)

19 The histogram shows information about the speeds of cars travelling along a road on Monday.



16 of the cars travelled at a speed greater than 0 miles per hour but no more than 20 miles per hour.

None of the cars travelled at a speed greater than 50 miles per hour.

One of the cars is chosen at random.

(a) Find the probability that this car travelled at a speed greater than 20 miles per hour but no more than 30 miles per hour.

.....

(3)

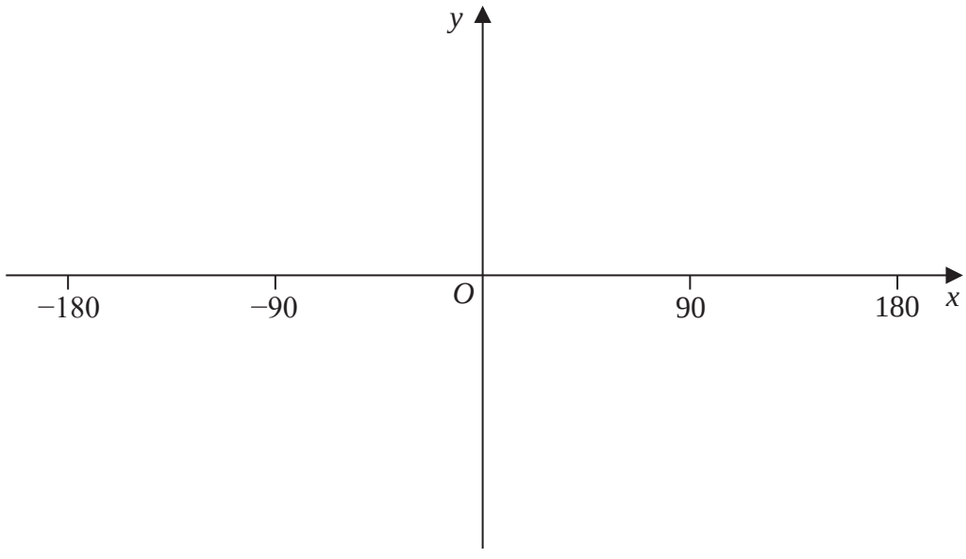
(b) Work out an estimate for how many of the cars travelled at a speed greater than 40 miles per hour.

.....

(2)

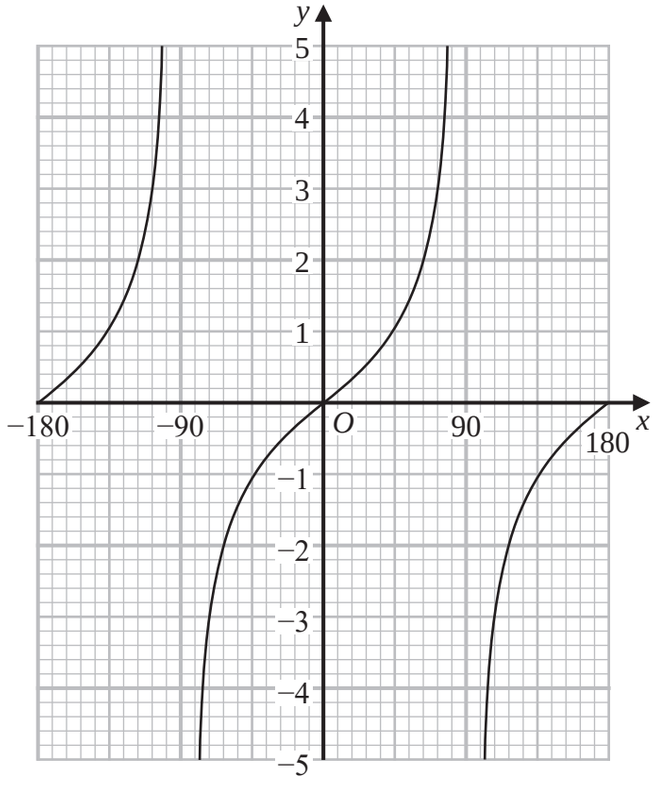
(Total for Question 19 is 5 marks)

20 (a) Using the axes below, sketch the graph of $y = \sin x°$ for $-180 \leqslant x \leqslant 180$
Label each turning point with its coordinates.



(3)

Here is the graph of $y = \tan x°$ for $-180 \leqslant x \leqslant 180$



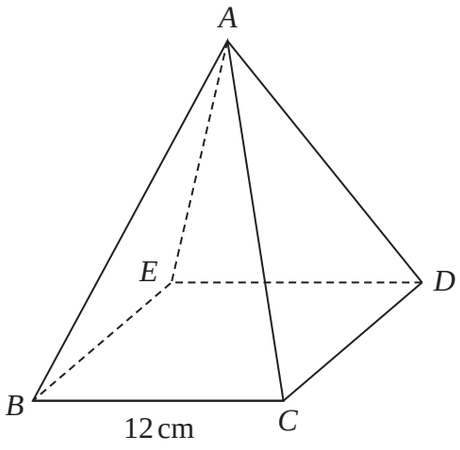
(b) Find all **four** solutions of $\tan x° = 1$ for $-360 \leqslant x \leqslant 360$

.....

(2)

(Total for Question 20 is 5 marks)

21 The diagram shows the solid pyramid *ABCDE*.



The base *BCDE* of the pyramid is a horizontal square with sides of length 12 cm.
The vertex *A* of the pyramid is vertically above the midpoint of *BD*.

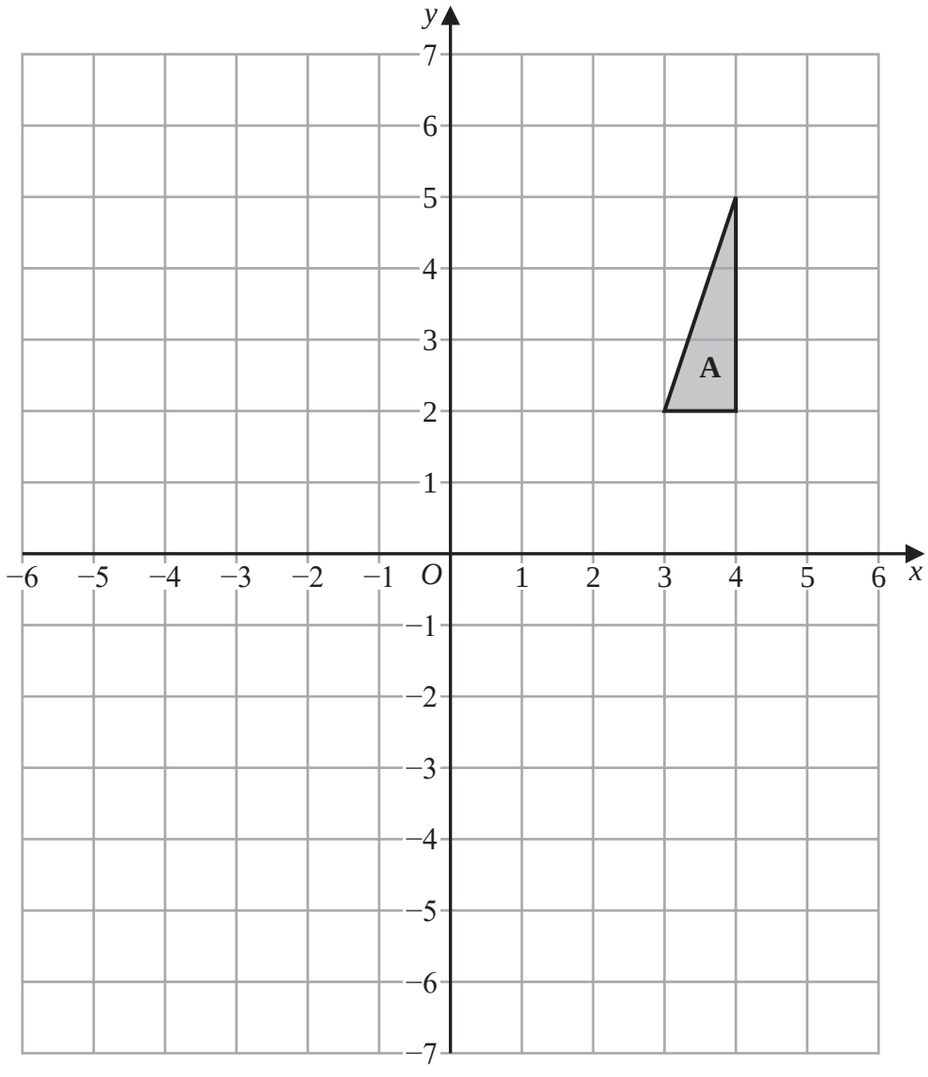
The volume of the pyramid is 768 cm^3

Calculate the size of the angle between *AB* and the base of the pyramid.
Give your answer correct to 1 decimal place.

.....°

(Total for Question 21 is 4 marks)

22



Triangle **A** is transformed by a combined transformation of a reflection in the line $y = -x$ followed by a rotation.

Under the combined transformation, two of the vertices of the triangle are invariant.

Describe fully one possible rotation.

.....

.....

.....

(Total for Question 22 is 2 marks)

TOTAL FOR PAPER IS 80 MARKS

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