



THE ENGLISH SCHOOL
MID PROGRAM ENTRY INTO YEAR 4

MATHEMATICS

SATURDAY 31st May 2025

Time allowed: 2 hours

Instructions to candidates

Answer all the questions in the spaces provided.

Without sufficient working, correct answers may be awarded no marks.

Information to candidates

This paper has 28 questions.

There are 23 pages in this question paper.

Full marks may be obtained for answers to all questions.

The total marks for this paper is 120.

The marks for each question is shown in round brackets, e.g. (2)

Calculator may be used.

Advice for candidates

Write your answers neatly and in good English.

Work steadily through the paper.

Do not spend too long on one question.

Show all stages in any calculations.

Materials required for the paper

Calculator, ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks:

.....%

1. Solve $\frac{7+3y}{2} + 5 = 4y - 7$

Show clear algebraic working.

$y = \dots\dots\dots$
(3)

2. (2, 5) is the midpoint of the line joining (a, b) and (3a, 3).
Find the values of a and b.

$a = \dots\dots\dots$
 $b = \dots\dots\dots$
(3)

3. (a) Simplify $\frac{8t^7v}{2t^2v^3}$

$\dots\dots\dots$
(2)

- (b) Given that n is positive integer, find the value of n.

$$\frac{n^{10}}{n^3 \times n^5} = 9$$

$\dots\dots\dots$
(2)

4. Steve bought a box of 200 hats for £120

He decided to sell them at a local market.

It cost him £20 to hire a stall at the market.

Steve sold 70% of the hats at £3 each.

He sold a quarter of the hats at £2.50 each.

The remaining hats were sold at £1 each.

Calculate the percentage profit that Steve made? Give your answer to 3 significant figures.

..... %
(5)

5. (a) Express 360 as a product of its prime factors in index form.

.....
(2)

(b) What is the smallest whole number that 360 can be multiplied by to give a square number?

.....
(1)

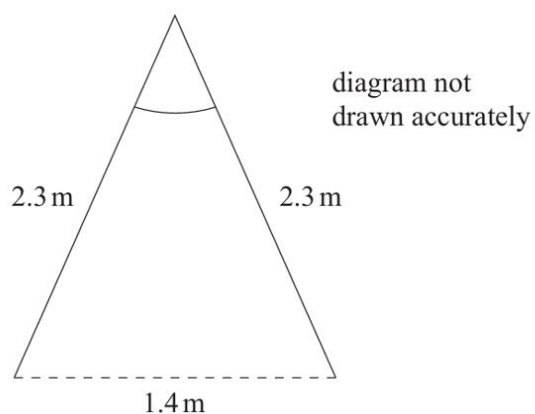
6. Make x the subject of $x + 3 = \frac{4(x-1)}{y}$

.....
(3)

7. Calculate $(2.3 \times 10^{114}) \div (4.6 \times 10^{117})$
Give your answer in standard form.

.....
(3)

8. A stepladder with sides of 2.3 m is opened so that the feet are 1.4 m apart.



Calculate the angle to which the stepladder has been opened, correct to 1 decimal place.

.....^o
(3)

9. The formula for h is

$$h = \frac{u^2}{2a}$$

Given that

$u = 21.34$ correct to 4 significant figures,

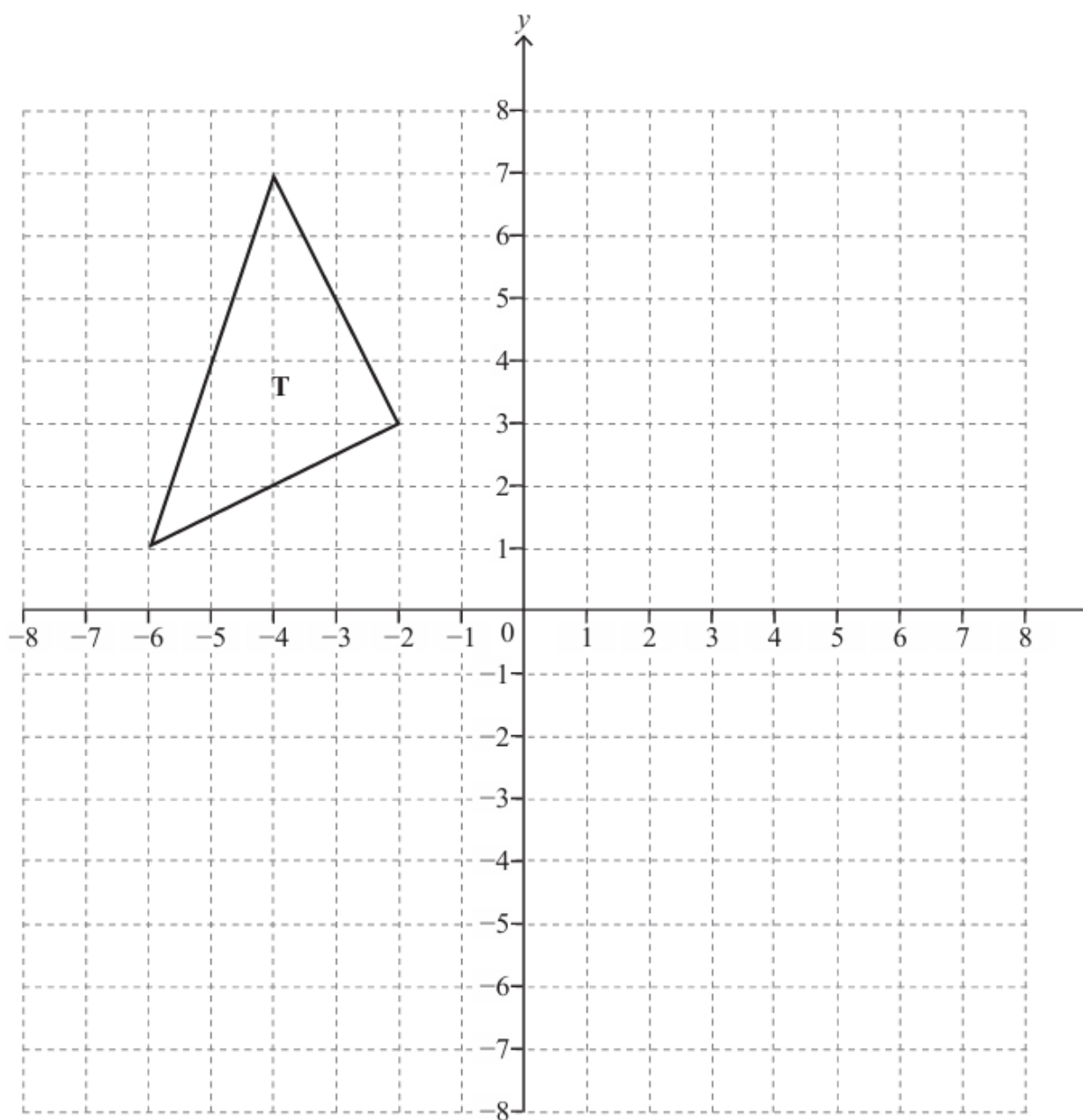
$a = 9.8$ correct to 1 decimal place,

calculate the upper bound of h . Give your answer correct to 3 significant figures.

$h =$
(3)

10. Triangle **T** is reflected in the line $y = x$ and then enlarged by a scale factor of $\frac{1}{2}$ using the centre of enlargement (7, 2).

Draw the final image and label it **F**.



(4)

11. $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$

$Q = \{\text{factors of } 24\}$

$R = \{\text{multiples of } 3\}$

$S = \{\text{odd numbers}\}$

(a) Explain why $3 \in (Q \cap S)$

.....

.....

(1)

(b) List the elements of the set $S' \cap R$

.....

(1)

(c) Find $n(S)$

.....

(1)

12. A, B, C and D are numbers such that

$$A : B = 2 : 5$$

$$A : D = 3 : 8$$

$$B : C = 9 : 11$$

Find $C : D$

Give your answer in its simplest form.

.....

(3)

13. Line AB is shown below.

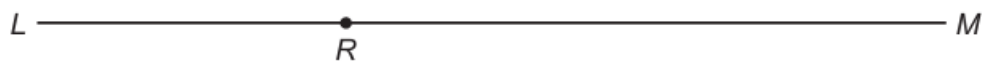
Using only a ruler and a pair of compasses, construct an angle of 60° at point B.



(2)

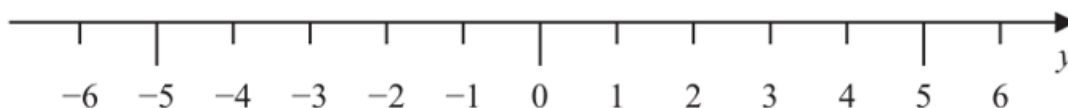
(b) R is a point on the line LM.

Using only a ruler and a pair of compasses, construct an angle of 90° at point R.



(2)

14. (a) On the number line, represent the inequality $-5 < y \leq 3$



(2)

- (b) John spends x hours each week on homework.

Joanne spends 3 hours more than John each week on homework.

In total they spend more time on homework each week than Sam, who spends 14 hours per week on homework.

Write down an inequality and solve it for x .

..... (3)

15.

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blank

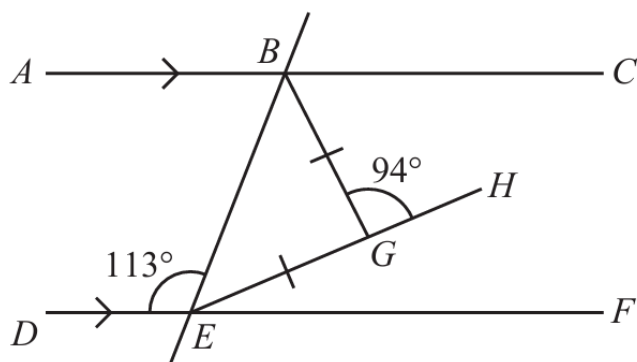


Diagram **NOT**
accurately drawn

In the diagram, BGE is an isosceles triangle with $EG = BG$
 ABC , DEF and EGH are straight lines.
 ABC is parallel to DEF

$$\widehat{DEB} = 113^\circ \quad \widehat{BGH} = 94^\circ$$

Find the size, in degrees, of $\widehat{CBG}$
 Give a reason for each stage of your working.

.....^o
(4)

16. Liquid A has a density of 0.71 g/cm^3
Liquid B has a density of 1.2 g/cm^3

19 cm^3 of liquid A and 161 cm^3 of liquid B are mixed to make liquid C.

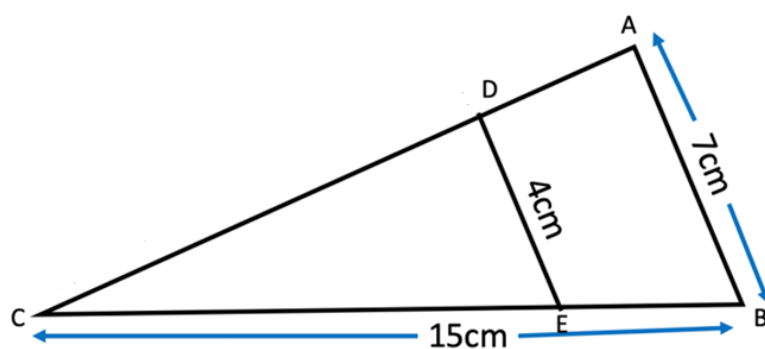
Calculate the density of liquid C. Give your answer correct to 2 decimal places.

..... g/cm^3
(4)

17. Triangle ABC is similar to triangle CDE .

DE is parallel to AB .

Find the length of EB , giving your answer as a mixed number.



..... cm
(3)

18. $x = 0.\dot{2}$ $y = 0.6\dot{8}1$

Express x and y as fractions and work out the value of xy
Give your answer as a fraction in its simplest form.

.....
(5)

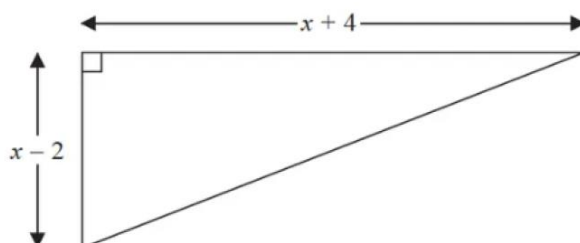
19. The diagram shows a right-angled triangle.

All measurements are in centimetres.

The area of the triangle is 27.5cm^2

Write down an equation and solve it

to work out the length of the shortest side of the triangle.



..... cm
(4)

20. Chetan owns a fruit shop.

The table below shows the weight of citrus fruit, the weight of berries and the weight of tropical fruit Chetan sold in March.

Fruit type	Weight sold
citrus	508 kg
berries	126 kg
tropical	86 kg

Chetan is going to draw a pie chart for this information.

(a) Calculate the size, in degrees, of the angle of the sector in the pie chart for the weight of berries sold in March.

.....^o
(2)

The table below gives information about the weight, in kg, of berries sold on each of the 30 days in April.

Weight (w kg)	Frequency
$0 < w \leq 5$	10
$5 < w \leq 10$	7
$10 < w \leq 15$	6
$15 < w \leq 20$	5
$20 < w \leq 25$	2

(b) Find the class interval that contains the median weight.

.....
(1)

(c) Calculate an estimate for the mean weight, in kg, of berries sold on each day in April.

..... kg
(4)

Chetan wants to buy 60 kg of apples for his shop from one of the following online traders.

US traders 12 kg box of apples for \$29.50 Free delivery Buy 4 boxes and get a 5th box free
--

French traders 1.72 euros per kg of apples Total delivery cost of 22.80 euros Special offer of 15% off the cost of apples and the cost of delivery
--

Using an exchange rate of

$$\text{\$1} = 0.92 \text{ euros}$$

(d) compare the cost, including delivery, of 60 kg of apples bought from US traders with the cost of 60 kg of apples bought from French traders.
State which of the traders is the cheaper when buying 60 kg of apples.
Show all your working.

.....
(5)

21. (a) Sarah rolls a fair dice and tosses a fair coin.

What is the probability that she gets a number less than 5 and a Head?

Show your working out.

.....
(2)

(b) In a box there are bronze, silver and gold medals.

There are 21 bronze and 42 silver medals.

A medal is taken at random from the box.

The probability of taking a gold medal is $\frac{3}{10}$

How many gold medals are there?

.....
(3)

22.

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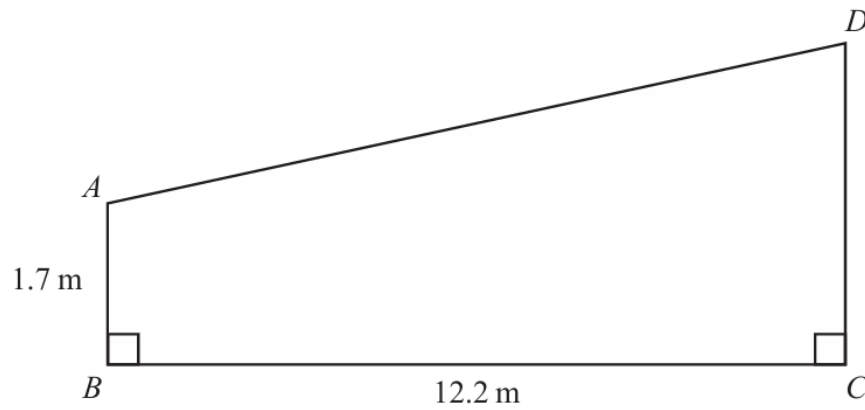


Diagram **NOT**
accurately drawn

The diagram shows quadrilateral $ABCD$ where B and C are on horizontal ground and BA and CD are vertical.

$$BC = 12.2 \text{ metres} \quad AB = 1.7 \text{ metres} \quad \hat{ABC} = \hat{BCD} = 90^\circ$$

The angle of elevation of D from A is 32°

Calculate the length, in metres to 3 significant figures, of CD

..... m
(3)

23. (a) Write $(3 - \sqrt{5})^2$ in the form $c - d\sqrt{5}$ where c and d are integers.

.....
(2)

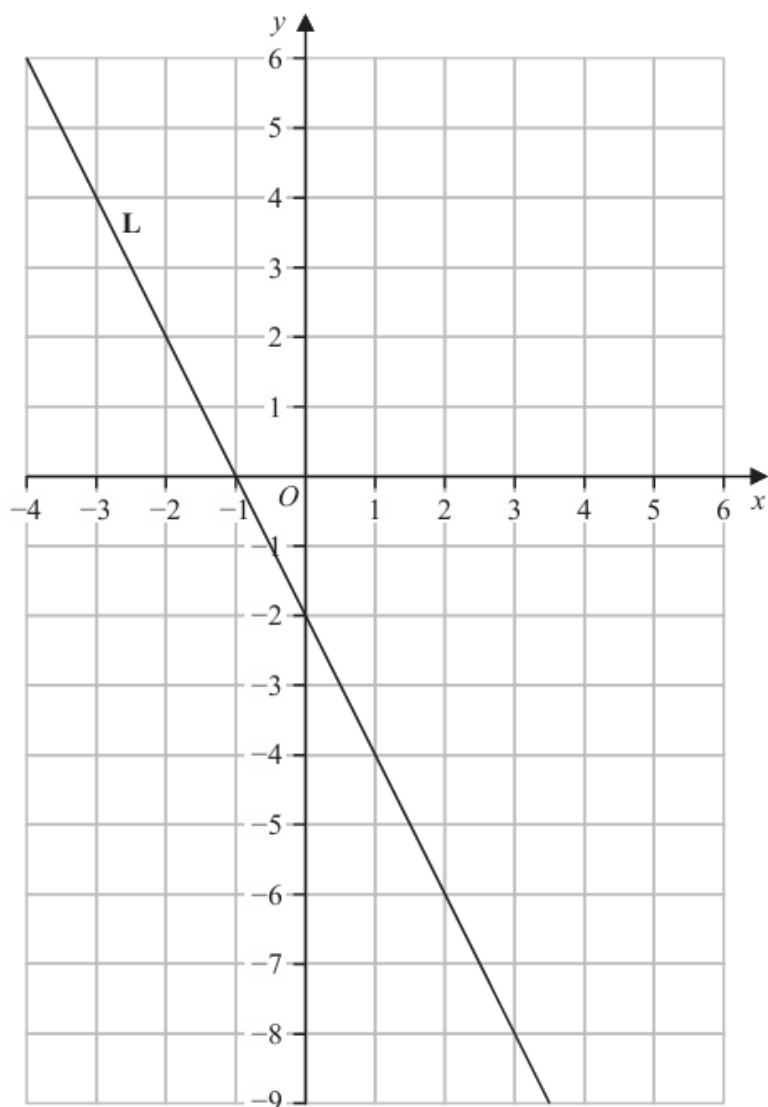
(b) Without using a calculator and by showing all steps in your working, show that

$$\frac{4 + 3\sqrt{5}}{(3 - \sqrt{5})^2 + \sqrt{20}}$$

can be written in the form $e + \frac{\sqrt{5}}{f}$ where e and f are integers to be found.

$e = \dots\dots\dots f = \dots\dots\dots$
(4)

24. The line **L** with equation $y = -2x - 2$ is drawn on the grid below.



- (a) On the same grid, draw the graph with equation $x - y = 4$
for values of x from -4 to 6

(2)

- (b) On the same grid, draw the graph with equation $3y + x = -3$
for values of x from -4 to 6

(2)

- (c) Show, by shading on the grid opposite, the region **R** defined by all of the inequalities

$$x - y \leq 4 \quad y \geq -2x - 2 \quad 3y + x \leq -3$$

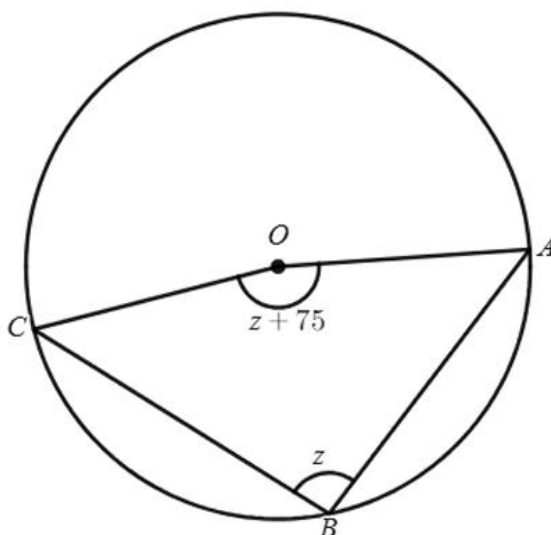
Label the region **R**

(1)

The point P with coordinates (x, y) lies in the region $\mathbf{R}$
 Given that y is an integer and P lies on the line with equation $x = 1$
 (d) write down all the possible y coordinates of the point P

.....
 (1)

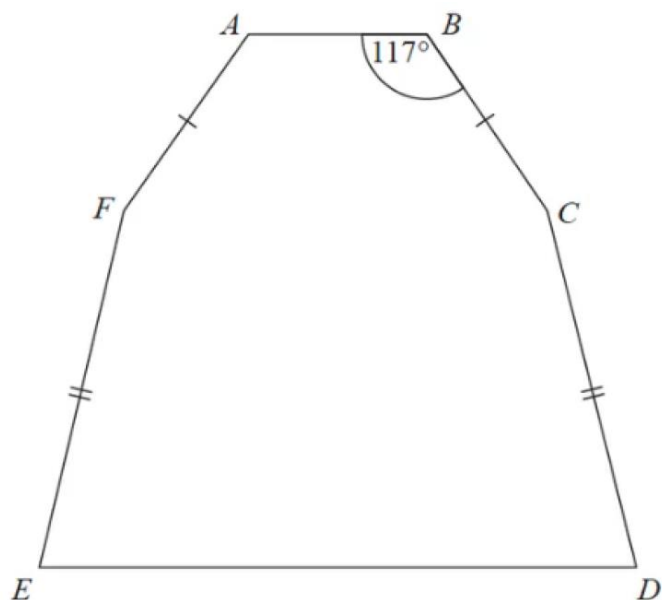
25. A, B and C are points on a circle, centre O .
 Angle $ABC = z$
 Angle $AOC = z + 75$



Work out the value of z .

$z =$ ^o
 (3)

26. The diagram shows a hexagon.
The hexagon has one line of symmetry.



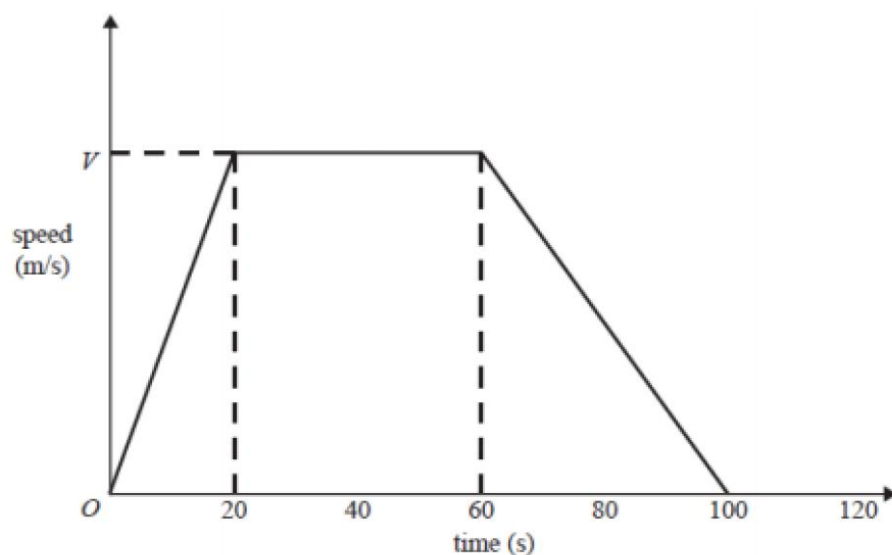
Angle $BCD = 2 \times \text{angle } CDE$

Work out the size of angle AFE .

You must show all your working.

.....^o
(4)

27. Here is a speed-time graph for a car journey. The journey took 100 seconds.



(a) The car travelled 1750 m in the 100 seconds. Work out the value of V .

..... m/s
(2)

(b) Find the speed of the car at 40 seconds.

..... m/s
(1)

(c) Find the acceleration in the first 4 seconds of the race.

..... m/s^2
(2)

28. Alison counts how many flowers her plants have in her garden.

Number of flowers	Frequency
1	3
2	7
3	12
4	31
5	27

(a) Find the range.

..... (1)

(b) Find the interquartile range.

..... (3)

29. Helena measures the population of lions in a nature reserve to be 400

She then sees the population increase by r % one year, then 1 % the year after, and 4 % the year after that.

Helena recalculates the population of lions to be 429

Determine r . Give your answer correct to 1 decimal place.

..... % (3)

TOTAL FOR PAPER IS 120 MARKS

END OF PAPER

ADDITIONAL PAGE

ADDITIONAL PAGE