Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Time 2 hours

Paper reference **4MA1/2F**

Mathematics A

PAPER 2F

Foundation Tier

You must have:
Ruler graduated in centimetres and millimetres, protractor, 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.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formulae page.
- Anything you write on the formulae page will gain NO credit.

Information

- The total mark for this paper is 100.
- 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

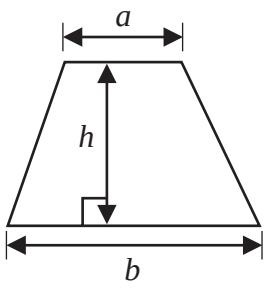
- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.
- Good luck with your examination.

Turn over ▶

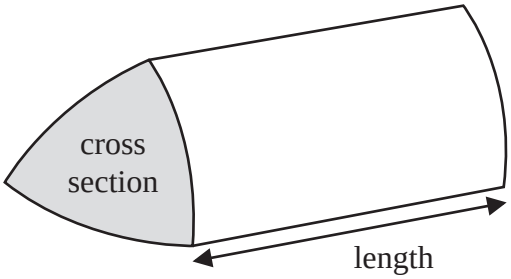
International GCSE Mathematics

Formulae sheet – Foundation Tier

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

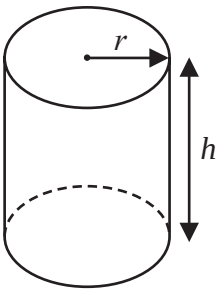


Volume of prism = area of cross section × length



Volume of cylinder = $\pi r^2 h$

Curved surface area of cylinder = $2\pi rh$



Answer ALL TWENTY FIVE questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 The table shows the length, in kilometres, of the coastline of each of five oceans.

Ocean	Length (kilometres)
Arctic	45 389
Atlantic	111 866
Indian	66 526
Pacific	135 663
Southern	17 968

(a) Which of these oceans has the greatest length of coastline?

Pacific (1)

.....

(1)

(b) Write the number 17 968 in words.

Seventeen thousand nine hundred and sixty eight. (1)

.....

(1)

(c) Write the number 66 526 correct to the nearest thousand.

↘ 5 or more, we round up 6 to 7.

67 000 (1)

.....

(1)

(d) Work out the total length of the coastlines of the Arctic Ocean and the Pacific Ocean.

45 389 + 135 663 = 181 052

181 052 (1) kilometres

.....

(1)

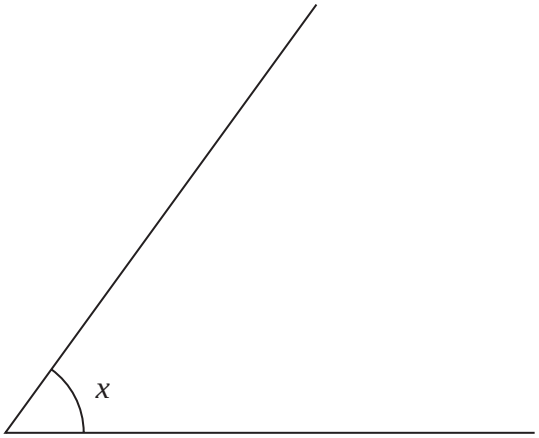
(Total for Question 1 is 4 marks)

2 (a) Write down the order of rotational symmetry of a square.

4 (1)

.....

(1)



(b) (i) Measure the size of the angle marked x.

54 (1) °

.....

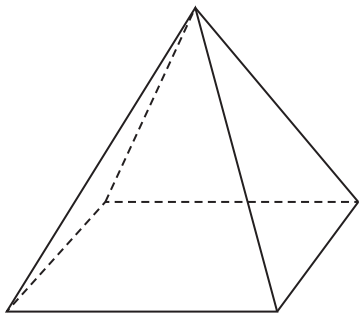
(ii) Write down the mathematical name of this type of angle.

Acute (1)

.....

(2)

Here is a 3-D shape.



(c) (i) Write down the mathematical name of this 3-D shape.

Pyramid (1)

.....

(ii) How many edges does this shape have?

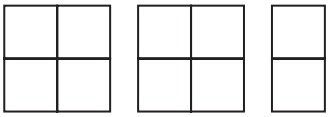
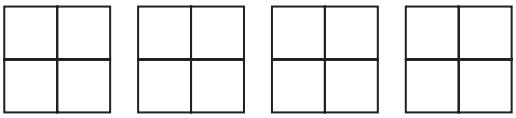
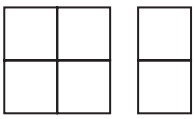
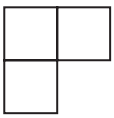
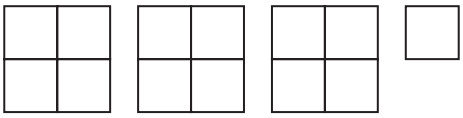
8 (1)

.....

(2)

(Total for Question 2 is 5 marks)

3 The pictogram gives some information about the number of parcels delivered by a delivery company on each of five days last week.

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

On Monday, the delivery company delivered 20 parcels.

Work out the total number of parcels delivered by the delivery company on these five days.

10 small boxes = 20 parcels

1 small box = 2 parcels (1)

Monday = 20

Tuesday = 16 x 2 = 32

Wednesday = 6 x 2 = 12 (1)

Thursday = 3 x 2 = 6

Friday = 13 x 2 = 26

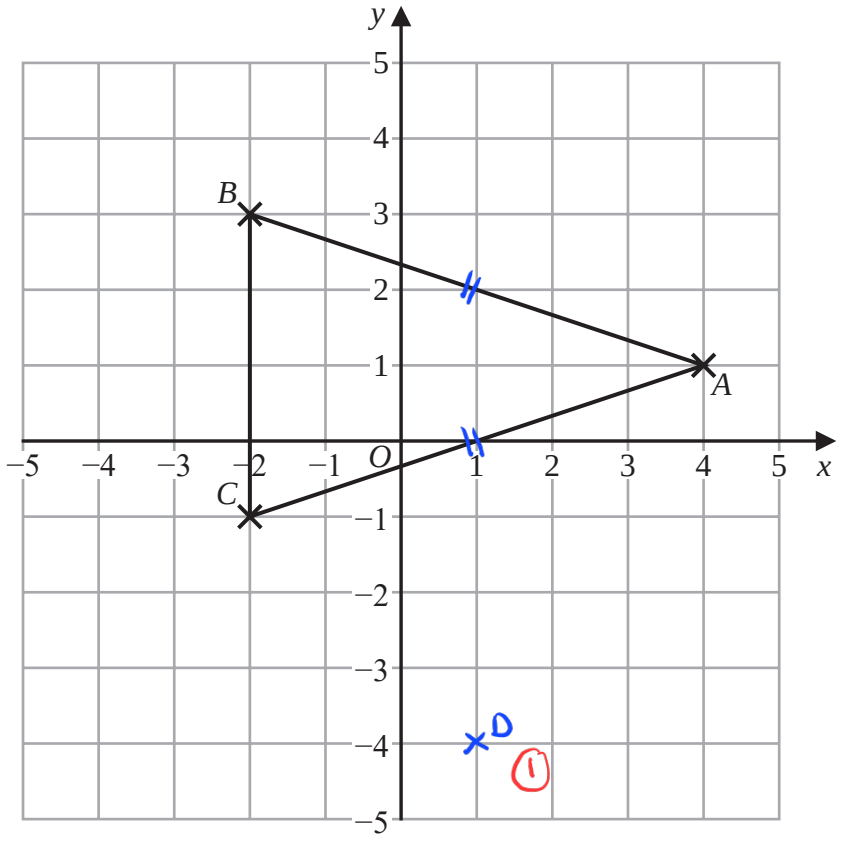
Total = 20 + 32 + 12 + 6 + 26 (1)

= 96 (1)

96

(Total for Question 3 is 4 marks)

4 The points *A*, *B* and *C*, shown on the grid, are the vertices of triangle *ABC*.



(a) Write down the coordinates of the point *B*.

(−2 , 3) (1)

(b) Write down the mathematical name of triangle *ABC*.

isosceles (1)

(1)

The coordinates of point *D* are (1, −4)

(c) On the grid, mark with a cross (×) the position of *D*.
Label the point *D*.

(1)

(d) Find the coordinates of the midpoint of *AB*.

A (4, 1) B (−2, 3)

midpoint AB : $\left(\frac{4+(-2)}{2}, \frac{1+3}{2}\right)$ (1)

: (1, 2) (1)

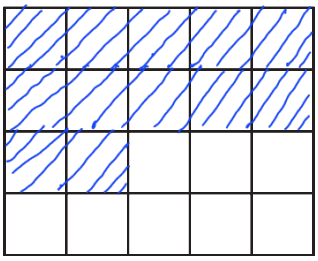
(1 , 2)

(2)

(Total for Question 4 is 5 marks)

5 Here is a shape made of squares.

20 squares



(a) Shade $\frac{3}{5}$ of the shape.

$\frac{3}{5} \times 20 = 12$ (1)

(1)

(b) Which one of these fractions is **not** equivalent to $\frac{4}{7}$?

(÷10) (÷2) (÷100) (÷5)

$\frac{40}{70}$ $\frac{8}{14}$ $\frac{400}{700}$ $\frac{14}{17}$ $\frac{20}{35}$

$\frac{14}{17}$ (1)

(1)

(c) Write $\frac{3}{10}$ as a percentage.

$\frac{3}{10} \times 100\% = 30\%$

30 (1) %

(1)

(d) Write $\frac{77}{9}$ as a mixed number.

$9\overline{)77}$ = 8 remainder 5

$= 8\frac{5}{9}$

$8\frac{5}{9}$ (1)

(1)

$\frac{5}{6}$ of a number is 40

(e) What is the number?

Let the number be N.

$\frac{5}{6} \times N = 40$

$N = 40 \times \frac{6}{5}$ (1)

$= 48$ (1)

48

(2)

(Total for Question 5 is 6 marks)

6 The cost of a mobile phone in the UK is £350
The cost of an identical mobile phone in India is 28 938 rupees.

The exchange rate is £1 = 91 rupees.

The cost of the mobile phone in the UK is more than the cost of the mobile phone in India.

Work out how much more.

Convert cost in UK to rupees :

350 x 91 = 31 850 (1)

31 850 - 28 938 = 2912 (1)

(1)

2912 rupees

(Total for Question 6 is 3 marks)

7 Hassan is going to eat at a restaurant.
Here is the menu at the restaurant.

Starter	Main course
Fruit (F) Prawns (P) Soup (S)	Burger (B) Curry (C) Lasagne (L) Risotto (R)

Hassan is going to choose one starter and one main course from the menu.

List all the possible combinations that Hassan can choose.

FB, FC, FL, FR, PB, PC, PL, PR, SB, SC, SL, SR. (2)

(Total for Question 7 is 2 marks)

8 (a) Simplify $w \times w \times w \times w \times w$

$w^{1+1+1+1+1} = w^5$

w^5 (1)

(1)

(b) Simplify $5a \times 3c$

$(5 \times 3) \times a \times c$

$= 15ac$

$15ac$ (1)

(1)

(c) Simplify $3e + 2f - e + 5f$

$3e - e + 2f + 5f$

$= 2e + 7f$

$2e + 7f$ (2)

(2)

(d) Solve $5x - 7 = x + 12$
Show clear algebraic working.

$5x - 7 = x + 12$

$5x - x = 12 + 7$ (1)

$4x = 19$ (1)

$x = \frac{19}{4}$

$= 4.75$ (1)

$x =$ 4.75

(3)

(Total for Question 8 is 7 marks)

9 The table shows information about the number of pieces of homework each student in Year 11 received last week.

Number of pieces of homework	Frequency
3	4
4	8
5	10
6	12
7	4

(a) Work out the range of the number of pieces of homework.

range = difference between highest and lowest

7 - 3 = 4 (1) (1)

4

(2)

(b) Write down the mode of the number of pieces of homework.

mode = class with highest frequency

6 (1)

(1)

(c) Work out the mean number of pieces of homework.
Give your answer correct to one decimal place.

$$\text{mean} = \frac{(4\times3)+(8\times4)+(10\times5)+(12\times6)+(4\times7)}{4+8+10+12+4}$$

$$= \frac{12+32+50+72+28}{38} \quad (1)$$

$$= \frac{194}{38} \quad (1)$$

$$= 5.1 \quad (1)$$

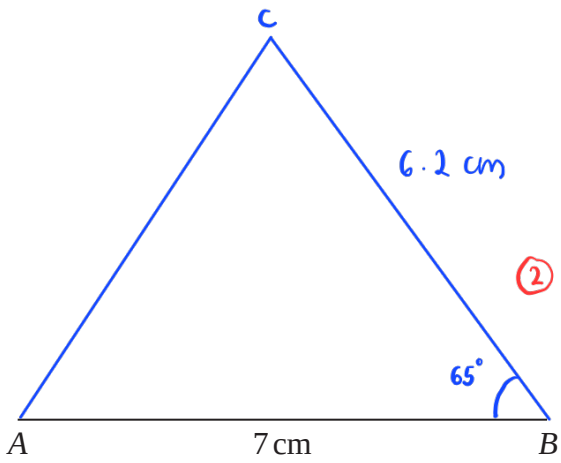
5.1

(3)

(Total for Question 9 is 6 marks)

10 *ABC* is a triangle.
AB = 7 cm and *BC* = 6.2 cm
Angle *ABC* = 65°

Draw accurately the triangle *ABC*.
The line *AB* has been drawn for you.



(2)

(Total for Question 10 is 2 marks)

11 A circle has radius 7.5 cm

Work out the area of the circle.
Give your answer correct to 3 significant figures.

Area of a circle : $\pi \times r^2$

$: \pi \times 7.5^2$ (1)

$: 177\ cm^2$ (1)

177 ..... cm^2

(Total for Question 11 is 2 marks)

12 This formula can be used to work out the cost, in riyals, of hiring a bicycle in Qatar for a number of days.

Cost = 65 × number of days + 44

Ghalia hired a bicycle in Qatar for 14 days.

(a) Work out the cost.

cost = 65 × 14 + 44 (1)

= 954 (1)

954 riyals

(2)

This formula can be used to work out the cost, in riyals, of hiring a helmet in Qatar for a number of days.

Cost = 12.5 × number of days

Kasun wants to hire a bicycle and a helmet for the same number of days.
He wants to hire them for as many days as he can.
He has 750 riyals to spend.

(b) Work out how much of the 750 riyals is not spent.

750 = [65 × days + 44] + [12.5 × days]

750 − 44 = 65 days + 12.5 days (1)

706 = 77.5 days

$\text{days} = \frac{706}{77.5}$

= 9.109 (1)

∴ Kasun can only afford 9 days

706 = 77.5 (9) (1)

706 = 697.5

706 − 697.5 = 8.5 (1)

∴ 8.5 riyals left unspent

8.5 riyals

(4)

(Total for Question 12 is 6 marks)

13 There are some counters in a bag.

7 of the counters are blue.
5 of the counters are green.
The rest of the counters are yellow.

One counter is going to be taken at random from the bag.

The probability that the counter is blue or is green is $\frac{6}{13}$

Work out how many yellow counters there are in the bag.

Blue + green = 7 + 5 = (12)

P(B or G) = $\frac{6 \times 2}{13 \times 2} = \frac{(12)}{26}$ (1)

Yellow counters = 26 − 12 (1)

= 14 (1)

14

(Total for Question 13 is 3 marks)

14 (a) Work out 39% of 450

$\frac{39}{100} \times 450$ (1)

$= 175.5$ (1)

175.5

(2)

(b) Write one pair of brackets in this calculation so that the answer is correct.

$$9 \times 8 - 5 - 2 = 25$$

$$9 \times (8 - 5) - 2 = 25$$ (1)

(1)

(c) Work out the value of $\frac{\sqrt{8.9}}{6.2 - 3.5}$

Give your answer as a decimal.
Write down all the figures on your calculator display.

$= \frac{\sqrt{8.9}}{2.7}$

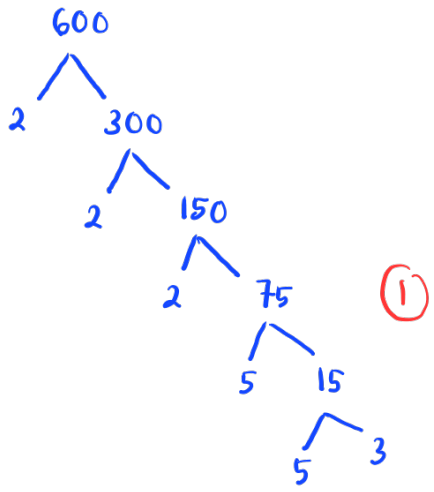
$= 1.104921029$ (2)

1.104921029

(2)

(Total for Question 14 is 5 marks)

15 Write 600 as a product of powers of its prime factors.
Show your working clearly.



(1)

$2 \times 2 \times 2 \times 3 \times 5 \times 5$ (1) $= 600$

$2^3 \times 3 \times 5^2 = 600$

$2^3 \times 3 \times 5^2$ (1)

(Total for Question 15 is 3 marks)

16 Show that $2\frac{4}{7} \div 1\frac{1}{8} = 2\frac{2}{7}$

LHS : $\frac{18}{7} \div \frac{9}{8}$ (1)

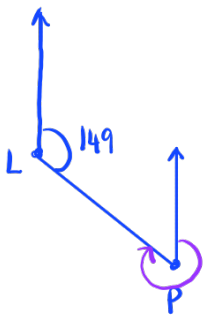
$= \frac{\cancel{18}^{2}}{7} \times \frac{8}{\cancel{9}_{1}}$ (1)

$= \frac{16}{7} = 2\frac{2}{7}$ (1)

(Total for Question 16 is 3 marks)

17 The bearing of Paris from London is 149°

Work out the bearing of London from Paris.



$= 360° - (180° - 149°)$ (1)

$= 360° - 31°$

$= 329°$ (1)

329 °

(Total for Question 17 is 2 marks)

18 $\mathscr{E}$ = {letters of the alphabet}
B = {b, r, a, z, i, l}
I = {i, r, e, l, a, n, d}

(a) List the members of the set

(i) $B \cup I$ - in set B or in set I

b, r, a, z, i, l, e, n, d (1)

(ii) $B \cap I'$ - in set B and not in set I

b, z (1)

(2)

K = {k, e, n, y, a}

Cody writes down the statement $B \cap K = \varnothing$
Cody's statement is wrong.

(b) Explain why.

There is letter 'a' in both sets. (1)

(1)

(Total for Question 18 is 3 marks)

19

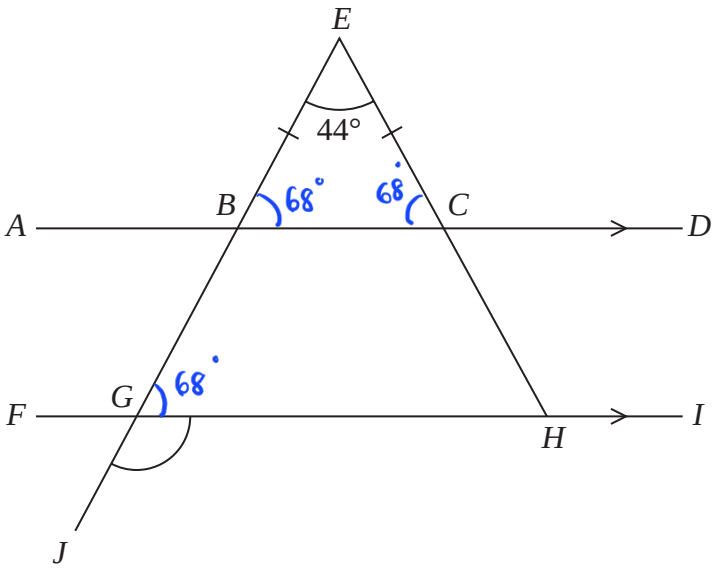


Diagram **NOT** accurately drawn

ABCD and *FGHI* are parallel straight lines.
EBGJ and *ECH* are straight lines.

BE = *CE*
Angle *BEC* = 44°

Work out the size of angle *JGH*.
Give a reason for each stage of your working.

angle EBC = $\frac{180^\circ - 44^\circ}{2}$ = 68° (1)

(angles at the base of isosceles triangle are the same)

Angle BGH = angle EBC = 68° (1)

(corresponding angles are the same) (1)

angle JGH = 180° − 68° = 112° (1)

(angles on a straight line sum up to 180°) (1)

112 °

(Total for Question 19 is 5 marks)

20 Mariana sells bags of bird food.

The bags that Mariana sold last week each contained 12 kg of seeds.

The bags that she is going to sell next week will each contain a mixture of nuts and seeds where for each bag

Total proportion = 9

$$\text{weight of nuts} : \text{weight of seeds} = 4 : 5$$

seeds = $\frac{5}{9}$ of bag

The total weight of the nuts and the seeds in each bag will be 19.35 kg

The weight of seeds in each bag that Mariana sells next week will be less than the weight of seeds in each bag that Mariana sold last week.

Work out this decrease as a percentage of the weight of seeds in each bag that Mariana sold last week.
Give your answer correct to one decimal place.

Weight of seeds in next week's bag :

$\frac{5}{9} \times 19.35 = 10.75$ kg (2)

Decrease in percentage : $\frac{10.75 - 12}{12} \times 100\%$ (1)

$= -10.4\%$ (1)

∴ decrease of 10.4 % from last week

10.4 ..... %

(Total for Question 20 is 4 marks)

21 Here is a right-angled triangle.

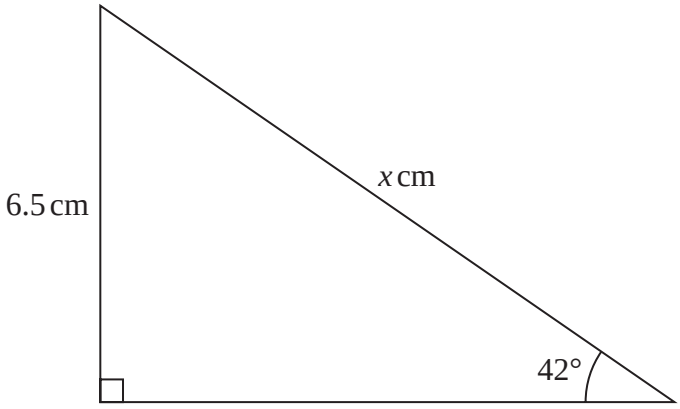


Diagram **NOT** accurately drawn

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

By using sine rule :

$$\frac{x}{\sin 90^\circ} = \frac{6.5}{\sin 42^\circ} \quad (1)$$

$$x = \frac{6.5}{0.669} \quad (1)$$

$$= 9.7 \quad (1)$$

$x =$ 9.7

(Total for Question 21 is 3 marks)

22 Solve the simultaneous equations

$$5a + 2c = 10 \quad -①$$
$$2a - 4c = 7$$

$\div 2$ ↳ $a - 2c = \frac{7}{2} \quad -②$

Show clear algebraic working.

substitute ② into ①:

$5\left(\frac{7}{2} + 2c\right) + 2c = 10$ ①

$\frac{35}{2} + 10c + 2c = 10$

$\frac{35}{2} + 12c = 10$

$12c = 10 - \frac{35}{2}$ ①

$c = \frac{-7.5}{12}$

$= -0.625$

$a = \frac{7}{2} + 2(-0.625)$

$= 2.25$ ①

$a =$ 2.25

$c =$ -0.625

(Total for Question 22 is 3 marks)

23 (i) Factorise $x^2 + 2x - 24$

$(x-4)(x+6)$

$(x-4)(x+6)$ ②

(2)

(ii) Hence solve $x^2 + 2x - 24 = 0$

$x = 4, -6$ ①

(1)

(Total for Question 23 is 3 marks)

24 Here is a triangular prism.

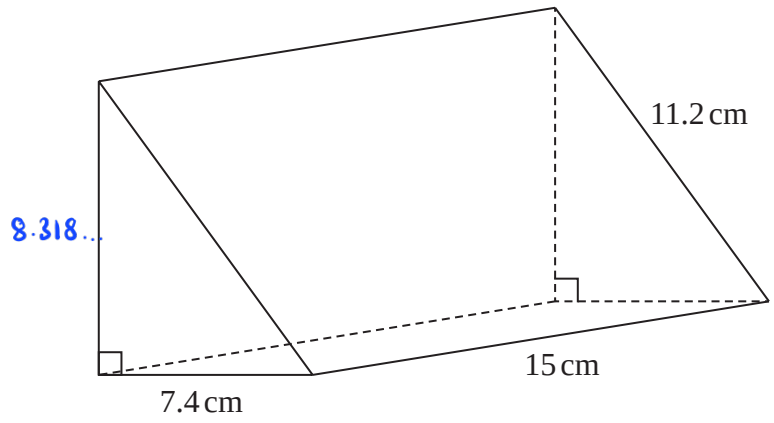


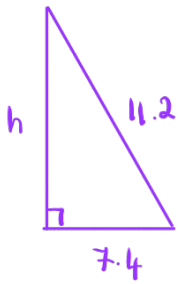
Diagram **NOT** accurately drawn

Work out the volume of the prism.
Give your answer correct to 3 significant figures.

Cross section of the prism :

$h = \sqrt{11.2^2 - 7.4^2}$ (1)

$= 8.407...$ (1)



Area of cross section :

$\frac{1}{2} \times 7.4 \times 8.407...$

$= 31.106...$ (1)

Volume of prism = Area of cross section × length

$= 31.106... \times 15$ (1)

$= 467$ (1)

467 cm^3

(Total for Question 24 is 5 marks)

25 Chengbo sold a house for 180 000 yuan.

The amount for which he sold the house is 24% more than the amount he paid for the house.

(a) Work out how much Chengbo paid for the house.
Give your answer correct to 3 significant figures.

$100\% + 24\% = 124\%$ (1)

$124\% = 180\,000$

$100\% = x$

$x = \frac{180\,000}{124} \times 100$ (1)

$= 145\,161$

$= 145\,000$ (3 s.f.) (1)

145 000 ..... yuan

(3)

Zhi bought a house on 1st January 2017
When she bought the house, its value was 120 000 yuan.

The value of the house increased by 1.8% per year.

(b) Work out the value of Zhi's house on 1st January 2020
Give your answer correct to 3 significant figures.

2017 to 2020 = 3 years

Value of house each year = $100\% + 1.8\%$
$= 101.8\%$ (1)

$120\,000 \times (101.8\%)^3$ (1) $= 126597.34$

$= 127\,000$ (3 s.f.) (1)

127 000 ..... yuan

(3)

(Total for Question 25 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

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