Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel International GCSE

Centre Number | Candidate Number

Thursday 4 June 2020

Morning (Time: 2 hours) | Paper Reference **4MA1/2F**

Mathematics A

Paper 2F

Foundation Tier

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.
- 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.

Turn over ▶

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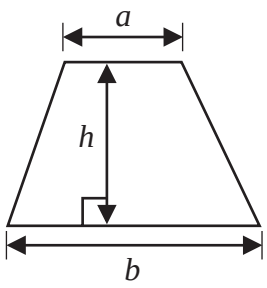
P 6 2 6 5 4 A 0 1 2 4

Pearson

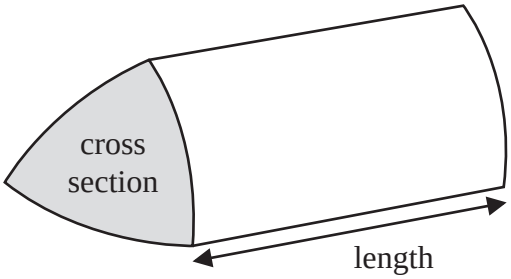
International GCSE Mathematics

Formulae sheet – Foundation Tier

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

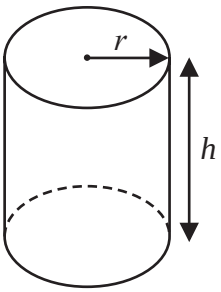


Volume of prism = area of cross section × length



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

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



Answer ALL TWENTY FOUR questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Here is a list of numbers.

1	17	21	25	26	31	39	64

From this list, write down

(a) an even number

26 (1)

.....

(1)

(b) a multiple of 3

21 (1)

.....

(1)

(c) a prime number

17 (1)

.....

(1)

(d) a cube number

64 (1)

.....

(1)

(Total for Question 1 is 4 marks)

2 (a) Change 3 litres into millilitres.

×1000

litres millilitres

÷1000

3 × 1000

= 3000 (1)

3000 millilitres

.....

(1)

(b) Change 6500 grams into kilograms.

÷1000

g kg

×1000

$\frac{6500}{1000}$ = 6.5 kg (1)

6.5 kilograms

.....

(1)

(Total for Question 2 is 2 marks)

3 Paula asks 16 members of her class the number of pets they each have.
Here are her results.

1	2	2	4	0	1	2	1
3	3	4	1	1	0	3	2

(a) Complete the frequency table for her results.

Number of pets	Tally	Frequency
0	II	2
1	~~HHT~~	5
2	IIII	4
3	III	3
4	II	2

(2)

(b) Write down the mode for the number of pets.

↘ most frequency

1 (1)

.....

(1)

(c) Work out the range for the number of pets.

↘ highest no. of pets - lowest no. of pets

5 - 1 = 4

4 (1)

.....

(1)

(Total for Question 3 is 4 marks)

4 The table gives the minimum temperature for January 2018 in each of six cities.

City	Minimum temperature (°C)
Barcelona	3
Donetsk	−10
Mexico City	−1
Mombasa	22
New York	−15
Sydney	15

(a) Which of these six cities has the lowest minimum temperature?

New York (1)

.....

(1)

(b) Work out the difference between the minimum temperature of Donetsk and the minimum temperature of Sydney.

15 - (-10)

= 25 (1)

25 .....°C

(1)

The minimum temperature in Edmonton for January 2018 was 50°C less than the minimum temperature in Mombasa for January 2018

(c) Work out the minimum temperature in Edmonton for January 2018

22 - 50

= -28 (1)

-28 .....°C

(1)

(Total for Question 4 is 3 marks)

5 (a) Write these decimals in order of size.
Start with the smallest decimal.

0.9 0.035 0.003 0.539 0.5

0.003 , 0.035 , 0.5 , 0.539 , 0.9 (1)

.....

(1)

(b) Write 0.6 as a percentage.

0.6 × 100% = 60% (1)

60 ..... %

(1)

(c) Write $\frac{60}{7}$ as a mixed number.

$7\overline{)60}$ 8, -56, 4 $= 8\frac{4}{7}$ (1)

$8\frac{4}{7}$

.....

(1)

(d) Work out the difference between $\frac{19}{20}$ and 0.68

Give your answer as a decimal.

$\frac{19}{20} = 0.95$

0.95 − 0.68 = 0.27 (1)

(1)

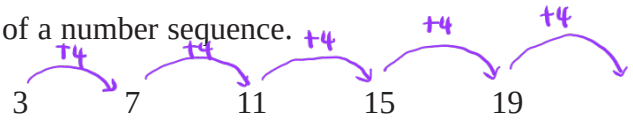
0.27

.....

(2)

(Total for Question 5 is 5 marks)

6 Here are the first five terms of a number sequence.



(a) Write down the next term of the sequence.

19 + 4 = 23

23 (1)

(1)

(b) Explain how you worked out your answer.

Add 4 to the last term above. (1)

(1)

(c) Find the first number greater than 70 that is in the sequence.

List down : 23, 27, 31, 35, 39, 43, 47, 51, 55, (1)

59, 63, 67, 71 (1)

71

(2)

Ada says,

"96 is a number in the sequence"

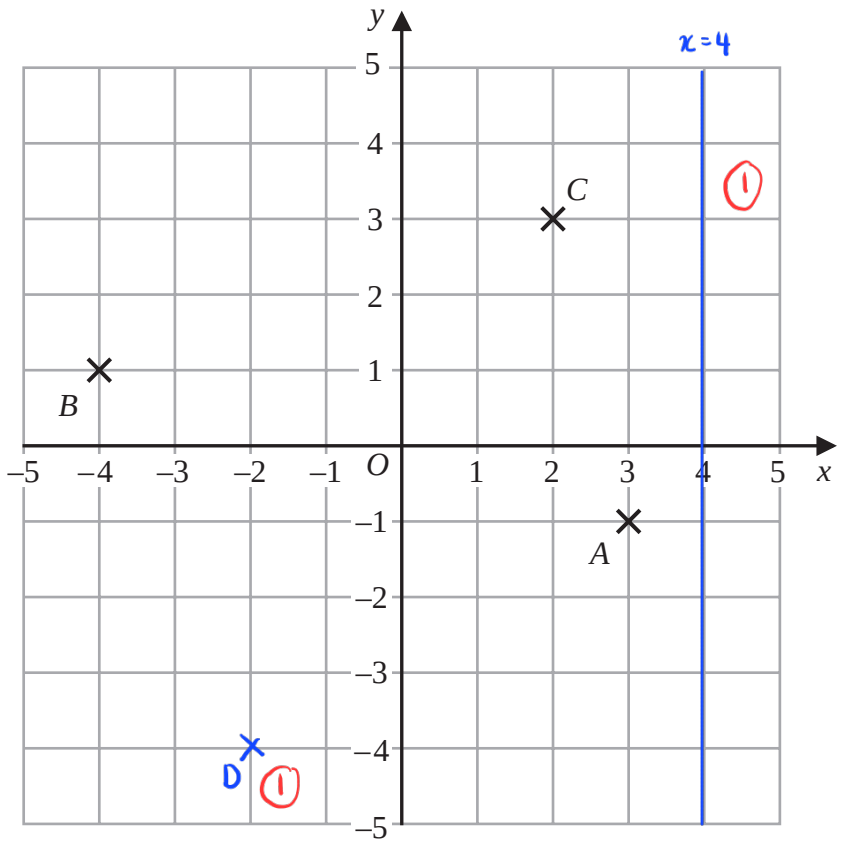
(d) Is Ada correct?
You must give a reason for your answer.

No. Because all number in the sequence are odd. (1)

(1)

(Total for Question 6 is 5 marks)

7 The diagram shows three points, A, B and C, marked on a grid.



(a) Write down the coordinates of point A.

(3 , −1)

(1)

The coordinates of the point D are $(-2, -4)$

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

(1)

(c) Find the coordinates of the midpoint of BC.

B(−4, 1) C(2, 3)

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

= (−1, 2)

(−1 , 2)

(2)

(d) On the grid, draw the line with equation $x = 4$

(1)

(Total for Question 7 is 5 marks)

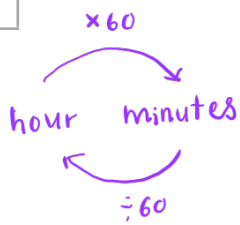
8 Lucas is going on a country walk.

Lucas works out how long each part of his walk will take.
This information is shown in the following table.

	Time taken
Walk from home to Village A	20 minutes
Walk from Village A to Village B	35 minutes
Stop for lunch in Village B	1 hour 15 minutes
Walk from Village B to home	30 minutes

Lucas leaves home at 11 10

At what time will Lucas get home?



Add all the times he took :

convert to minutes

= 20 minutes + 35 minutes + (1 hour × 60) + 15 minutes + 30 minutes (1)

= (20 + 35 + 75 + 30) minutes

convert to hours

= 160 minutes × $\frac{1 \text{ hour}}{60 \text{ minutes}}$ = 2 hour $\frac{2}{3}$ (60) minutes

= 2 hour 40 minutes (1)

Lucas arrives home at :

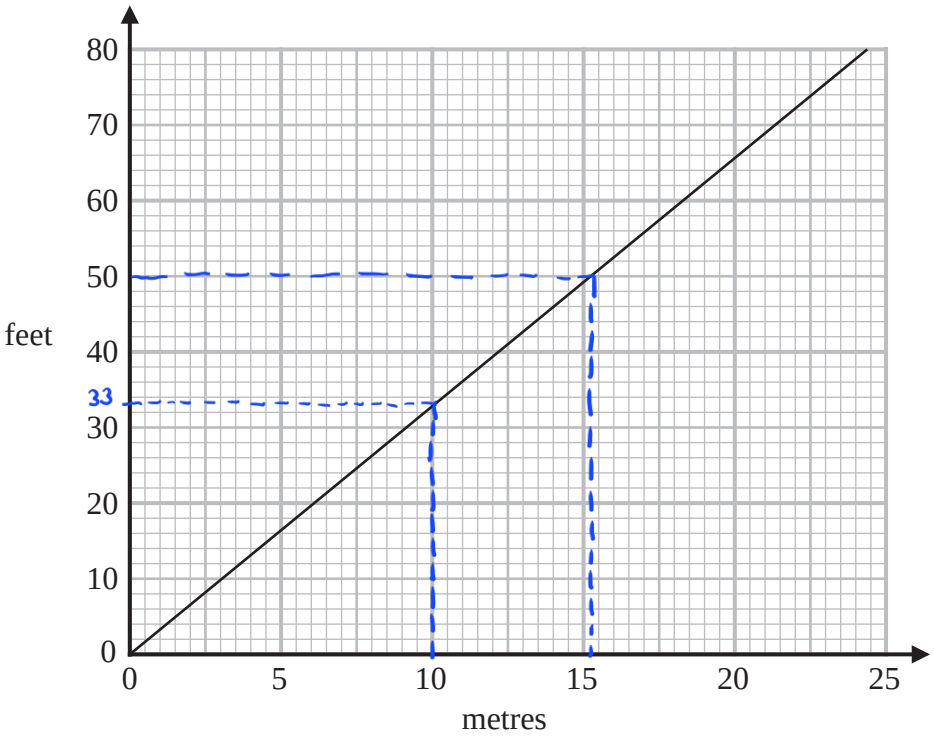
11 10 + 2 hour 40 minutes

= 13:50 or 1.50 pm (1)

1.50 pm

(Total for Question 8 is 3 marks)

9 Below is a conversion graph to change between metres and feet.



(a) Use the graph to change

(i) 10 metres to feet,

33 ✓1 ..... feet

(ii) 50 feet to metres.

15 ✓1 ..... metres

(2)

Joss lives 820 metres above sea level.
Nicky lives 2850 feet above sea level.

(b) Which is the greater, 820 metres or 2850 feet?
You must show how you get your answer.

from a) 10 m = 33 feet

820 m = 33 feet × 82 ✓1

= 2706 feet

∴ 2850 feet is greater ✓1

(2)

(Total for Question 9 is 4 marks)

10 Hugo records the number of pairs of trainers sold in each of four shoe shops last Saturday. He is going to draw a pie chart for his results.

The incomplete table shows two of Hugo's results and the sizes of three of the angles in his pie chart.

Name of shop	Number of pairs of trainers	Angle in pie chart
ABC Shoes	12	30°
Kilian Stuart Sports	18	45°
One Stop Shoes	48	120 (1) °
Superfast Trainers	66	165°

Complete the table.

Angle in pie chart (One stop shoes) = $360^\circ - 165^\circ - 45^\circ - 30^\circ$
$= 120^\circ$ (1)

ABC shoes = $\frac{30^\circ}{45^\circ} \times 18 = 12$ (1)

Superfast Trainers = $\frac{165^\circ}{120^\circ} \times 48 = 66$ (1)

(Total for Question 10 is 4 marks)

11 Work out 23% of 450 millilitres.

$\frac{23}{100}$ (1) × 450 = 103.5 (1)

103.5 ..... millilitres

(Total for Question 11 is 2 marks)

12 (a) Write down all the factors of 9

1, 3, 9

1, 3, 9 (1)

..... (1)

(b) Find the lowest common multiple (LCM) of 15 and 70

Multiples of 15 : 15, 30, 45, 60, 75, 90, 105, 120, 135, 150, 165, 180, 195, (210)

Multiples of 70 : 70, 140, (210) (1)

LCM of 15 and 70 is 210. (1)

210 .....

(2)

(Total for Question 12 is 3 marks)

13 The diagram shows the plan of Sophia's gym floor.

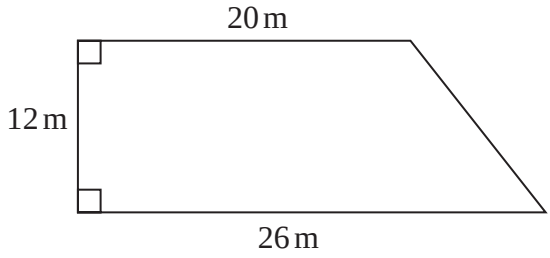


Diagram **NOT** accurately drawn

Sophia is going to paint all the gym floor.

Each tin of paint she is going to use covers an area of $20\,m^2$

There is a special offer on the paint that Sophia is going to buy.

Special Offer

1 tin for $13
4 tins for $40

Work out the least amount of money that Sophia has to pay in order to buy all the paint she needs.
Show your working clearly.

Finding the total area of gym floor :

$\frac{1}{2} \times (20 + 26) \times 12 = 276\ m^2$ (1)

(1)

Finding number of paint tins she needs :

$\frac{276\ m^2}{20\ m^2} = 13.8$ tins

(1)

∴ She needs 14 tins (13.8 is not a whole number)

• To buy 14 tins

Option 1 : $14 \times \$13 = \$182$ (1)

Option 2 : $4 \times \$40 = \$160$

Option 3 : $(3 \times \$40) + (2 \times \$13) = \$146$ (1)

$ 146

(Total for Question 13 is 5 marks)

14 (a) Factorise $25f - 10$

$5(5f - 2)$

$5(5f-2)$ (1)

(1)

(b) Make y the subject of the formula $c = 5y - h$

$c = 5y - h$

$c + h = 5y$ (1) $+h$

$\frac{c+h}{5} = y$ (1) $\div 5$

$y = \frac{c+h}{5}$

(2)

(c) Solve the inequality $4x + 7 > 2$

$4x + 7 > 2$

$4x > 2 - 7$ -7

$4x > -5$ (1)

$x > -\frac{5}{4}$ (1) $\div 4$

$x > -\frac{5}{4}$

(2)

(Total for Question 14 is 5 marks)

15 Show that $\frac{2}{5} \div \frac{11}{20} = \frac{8}{11}$

LHS : $\frac{2}{5} \div \frac{11}{20}$

$\frac{2}{\cancel{5}_1} \times \frac{\cancel{20}^4}{11}$ (1)

$= \frac{8}{11}$ (1)

(Total for Question 15 is 2 marks)

16 The table shows information about the lengths of time, in minutes, 120 customers spent in a supermarket.

Length of time (L minutes)	Frequency
$20 < L \leqslant 30$	6
$30 < L \leqslant 40$	26
$40 < L \leqslant 50$	31
$50 < L \leqslant 60$	40
$60 < L \leqslant 70$	17

(a) Write down the modal class.

↳ class with highest frequency

$50 < L \leqslant 60$ (1)

.....

(1)

(b) Work out an estimate for the mean length of time spent by the 120 customers in the supermarket.

$$\text{mean} = \frac{\text{midpoint} \times \text{frequency}}{\text{total frequency}}$$

$$\text{mean} = \frac{(25 \times 6) + (35 \times 26) + (45 \times 31) + (55 \times 40) + (65 \times 17)}{120} \quad (1)$$

$$= \frac{150 + 910 + 1395 + 2200 + 1105}{120} \quad (1)$$

$$= \frac{5760}{120} \quad (1) = 48 \quad (1)$$

48 minutes

.....

(4)

(Total for Question 16 is 5 marks)

17 Here is a list of ingredients needed to make apple crumble for 6 people.

Apple Crumble
Ingredients for 6 people
12 apples 150 g butter 195 g flour 90 g oats 120 g sugar

Nadiya wants to make apple crumble for 14 people.

(a) Work out the amount of butter she needs.

Butter for 1 person :

$\frac{150\text{ g}}{6} = 25\text{ g}$

Butter for 14 people :

$25\text{ g} \times 14 = 350\text{ g}$ (1)

(1)

350 g

(2)

Alison makes apple crumble for a group of people.

She uses 630 g of oats.

(b) Work out the number of people in the group.

Oats for 1 person :

$\frac{90\text{ g}}{6} = 15\text{ g}$

(1)

Finding number of people :

$\frac{630\text{ g}}{15\text{ g}} = 42\text{ people}$ (1)

42

(2)

At a cake sale, Michael sells some lemon cakes and some chocolate cakes.

the number of lemon cakes he sells : the number of chocolate cakes he sells = 2 : 7

Michael sells a total of 162 cakes.

(c) Work out the number of lemon cakes Michael sells.

Total ratio : $2+7=9$

Lemon cake sold : $\frac{2}{9} \times 162 = 36$ cakes

(1) (1)

36

(2)

(Total for Question 17 is 6 marks)

18

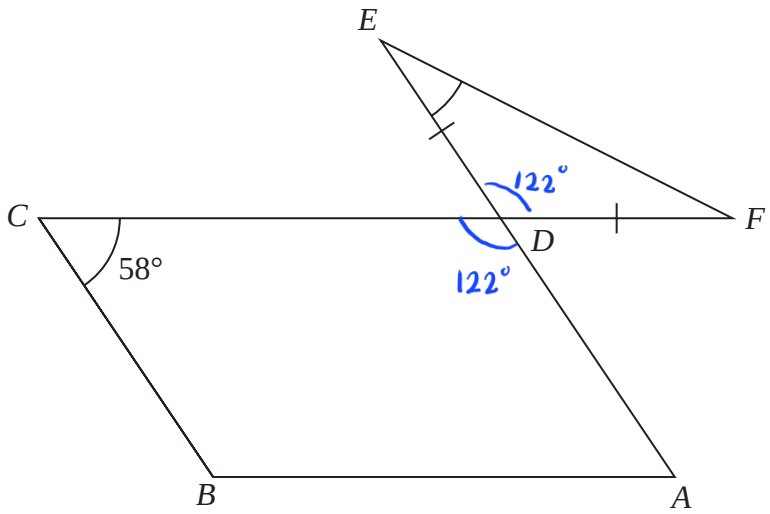


Diagram **NOT** accurately drawn

The diagram shows a parallelogram *ABCD* and an isosceles triangle *DEF* in which *DE* = *DF*

CDF and *ADE* are straight lines.
Angle *BCD* = 58°

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

angle ADC = $180^\circ - 58^\circ$

$= 122^\circ$ (1)

(co-interior angles add up to 180°) (1)

angle EDF = angle ADC = 122°

(vertically opposite angles are equal)

angle DEF = $\frac{180^\circ - 122^\circ}{2}$ (1) = $\frac{58^\circ}{2}$ ← (base angles in isosceles are the same)

$= 29^\circ$ (1)

(angles in triangle adds up to 180°) (1)

29 °

(Total for Question 18 is 5 marks)

19 Andreas, Isla and Paulo share some money in the ratios 3 : 2 : 5

The **total** amount of money that Isla and Paulo receive is £76 more than the amount of money that Andreas receives.

Andreas buys a video game for £48.50 with some of his share of the money.

Work out how much money Andreas has left from his share of the money when he has bought the video game.

Let : Andreas = $3x$

Isla = $2x$

Paulo = $5x$

$\therefore 5x + 2x - 3x = £76$

$x = £19$ (1)

Andreas has $3x \rightarrow 3 \times £19$

$= £57$ (1)

∴ Money Andreas has after buying video game :

$£57 - £48.50$ (1)

$= £8.50$ (1)

£ 8.50

(Total for Question 19 is 4 marks)

20 Himari's annual salary is 3 130 000 Japanese Yen (JPY).
She gets a salary increase of 4%

(a) Work out Himari's salary after this increase.

$3\,130\,000 + \frac{4}{100} \times 3\,130\,000$ (1)

$= 3\,130\,000 + 125\,200$ (1)

$= 3255\,200$ (1)

3 255 200 JPY

(3)

Kaito bought a car.
The value of the car when Kaito bought it was 750 000 JPY.
At the end of each year, the value of his car had depreciated by 15%

(b) Work out the value of Kaito's car at the end of 3 years.
Give your answer correct to the nearest JPY.

Initial value : 750 000 JPY

End of year 1 : $\frac{85}{100} \times 750\,000$ JPY $= 637\,500$ JPY (1)

End of year 2 : $\frac{85}{100} \times 637\,500$ JPY $= 541\,875$ JPY (1)

End of year 3 : $\frac{85}{100} \times 541\,875$ JPY $= 460\,594$ JPY (1)

460 594 JPY

(3)

(Total for Question 20 is 6 marks)

21 (a) Simplify $g^6 \times g^4$

$g^{6+4} = g^{10}$ (1)

g^{10}

(1)

(b) Simplify $(3cd^4)^2$

$3^2 \times c^2 \times d^{4\times 2}$ (1)

$= 9c^2d^8$ (1)

$9c^2d^8$

(2)

(c) Solve the simultaneous equations

$$4x + 3y = 17 \quad -(1)$$
$$x + 2y = 5$$

Show clear algebraic working.

$x = 5 - 2y \quad -(2)$

Substitute (2) into (1):

$4(5-2y) + 3y = 17$ (1)

$20 - 8y + 3y = 17$

$-5y = 17 - 20$ (−20)

$-5y = -3$ (÷(−5))

$y = \frac{3}{5} = 0.6$

$x = 5 - 2(0.6)$ (1)

$= 5 - 1.2$

$= 3.8$

$x =$ 3.8 (1)

$y =$ 0.6

(3)

(Total for Question 21 is 6 marks)

22 The diagram shows a right-angled triangle.

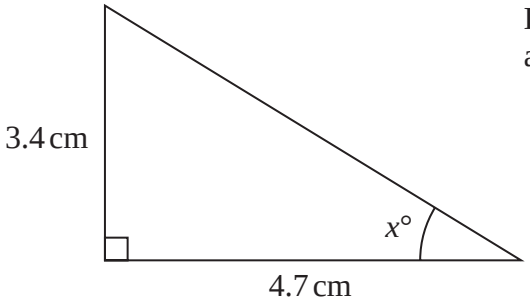


Diagram **NOT** accurately drawn

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

$\tan x^\circ = \frac{3.4 \text{ cm}}{4.7 \text{ cm}}$ (1)

$x^\circ = \tan^{-1} \frac{3.4}{4.7}$ (1)

$= 35.9^\circ$ (1)

$x =$ 35.9

(Total for Question 22 is 3 marks)

23 The diagram shows an isosceles triangle.

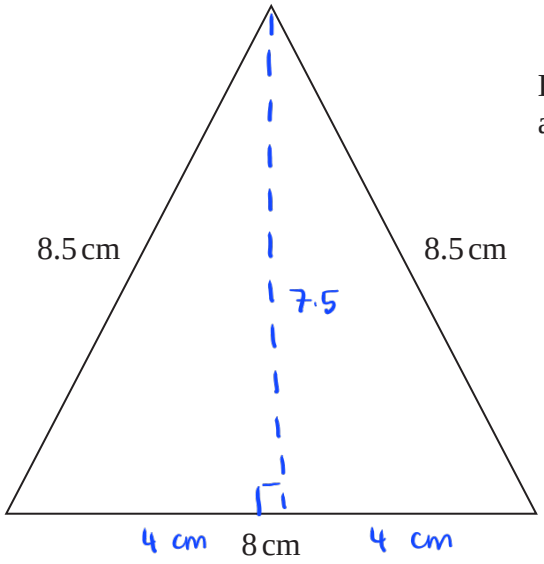


Diagram **NOT** accurately drawn

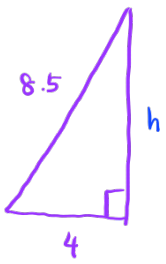
Work out the area of the triangle.

By using Pythagoras theorem :

$h = \sqrt{8.5^2 - 4^2}$

$= \sqrt{56.25}$ (1)

$= 7.5$ cm (1)



Area of triangle : $\frac{1}{2}$ x base x height

$= \frac{1}{2} \times 8 \text{ cm} \times 7.5 \text{ cm}$ (1)

$= 30 \text{ cm}^2$ (1)

30 ..... cm^2

(Total for Question 23 is 4 marks)

24 The diagram shows a solid cylinder with radius 3 m.

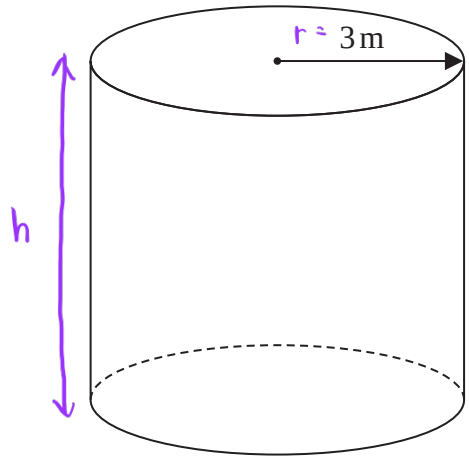


Diagram **NOT** accurately drawn

The volume of the cylinder is 72π m^3

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

Calculate the **total** surface area of the cylinder.
Give your answer correct to 3 significant figures.

Volume = $72\pi = \pi \times 3^2 \times h$ (1)

$h = \frac{72\pi}{9\pi} = 8$ m (1)

Area of base = $\pi \times r^2 = \pi \times 3^2$
$= 9\pi$

2 bases = $2 \times 9\pi$
$= 18\pi$

Area of lateral face = $2 \times \pi \times r \times h$
$= 2 \times \pi \times 3 \times 8$
$= 48\pi$ (1)

Total surface area = $18\pi + 48\pi$
$= 66\pi = 207$ m^2 (1)
(1)

207 ..... m^2

(Total for Question 24 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS