Mathematics

June 2024 Practice Paper 3 (Calculator)
Foundation Tier

Time: 1 hour 30 minutes

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.
- **Calculators may be used**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working.**

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.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Foundation Tier Formulae Sheet

Perimeter, area and volume

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:
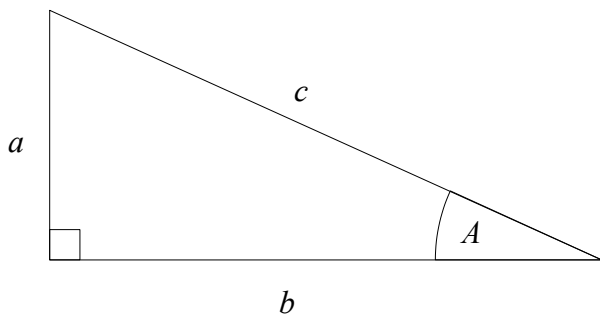
Area of a trapezium = $\frac{1}{2}(a + b)\,h$

Volume of a prism = area of cross section × length

Where r is the radius and d is the diameter:

Circumference of a circle = $2\pi r = \pi d$

Area of a circle = πr^2

Pythagoras' Theorem and Trigonometry

In any right-angled triangle where a, b and c are the length of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

In any right-angled triangle ABC where a, b and c are the length of the sides and c is the hypotenuse:

$$\sin A = \frac{a}{c} \qquad \cos A = \frac{b}{c} \qquad \tan A = \frac{a}{b}$$

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

Total accrued = $P\left(1 + \dfrac{r}{100}\right)^n$

Probability

Where P (A) is the probability of outcome A and P (B) is the probability of outcome B:

$$\text{P}(A \text{ or } B) = \text{P}(A) + \text{P}(B) - \text{P}(A \text{ and } B)$$

END OF EXAM AID

1 Change 25 metres to cm.

.... centimetres

(Total for Question 1 is 1 mark)

2 Write down two factors of 10

....

(Total for Question 2 is 1 mark)

3 Work out 3.5^2

....

(Total for Question 3 is 1 mark)

4 Shade $\dfrac{2}{5}$ of this shape.
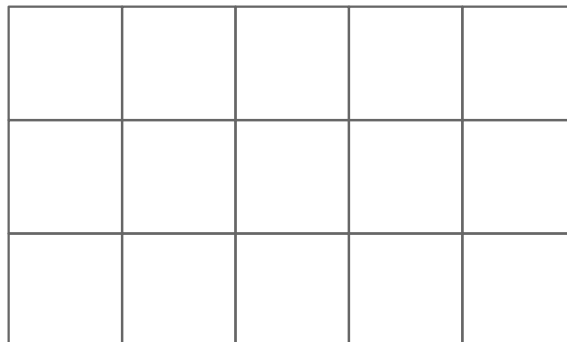
(Total for Question 4 is 1 mark)

5 Write a number in the box to make the calculation correct.

93.4 ÷ [   ] = 0.00934

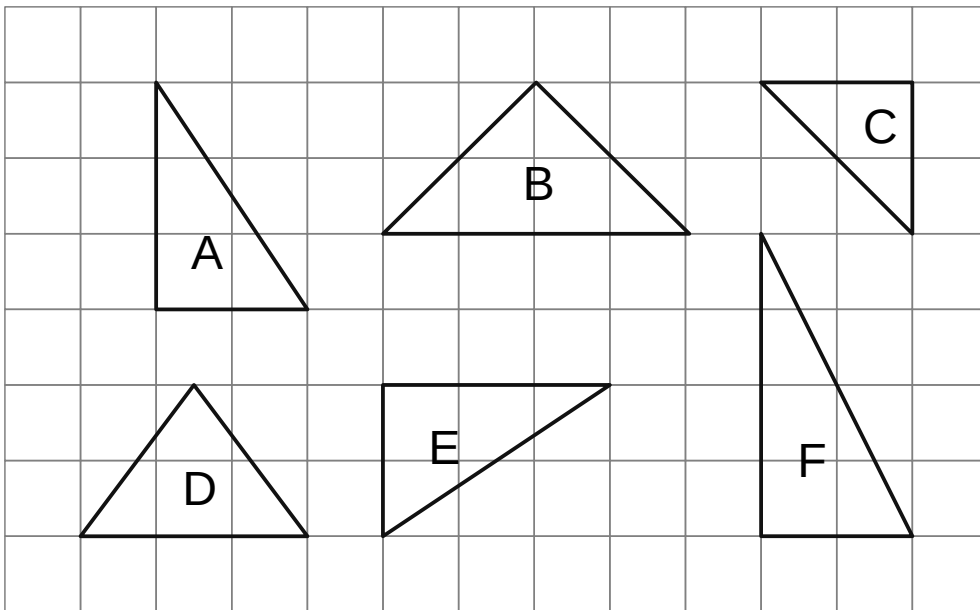**(Total for Question 5 is 1 mark)**

6 Write one pair of brackets in this calculation so that the answer is correct.

$$3 \times 5 - 2^2 - 3 = 14$$

7 Here are six triangles shown on a centimetre grid.

Two of these triangles are congruent.

Write down the letters of these two triangles.

.... and ....

8   In a shop each jar of coffee cost £3.70

Harold has £50 to spend on coffee.

Work out the greatest number of jars of coffee Harold can buy.

....

(Total for Question 8 is 2 marks)

9   Norah gets on a train at 7 49 am.

The train journey takes 2 hours and 45 minutes.

Norah then walks for 18 minutes to get to a meeting.

Does Norah get to the meeting before 11 am?
You must show how you get your answer.

(Total for Question 9 is 3 marks)

10 Here is a sequence of patterns made from sticks.

Pattern 1   Pattern 2   Pattern 3

(a) In the space below, draw Pattern number 4

(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of sticks	4	7	10		

(1)

(c) Work out the number of sticks in pattern 10.

....
(1)

(Total for Question 10 is 3 marks)

11 Bradley asked a group of people to name their favourite colour.
He draws a pie chart to show his results.
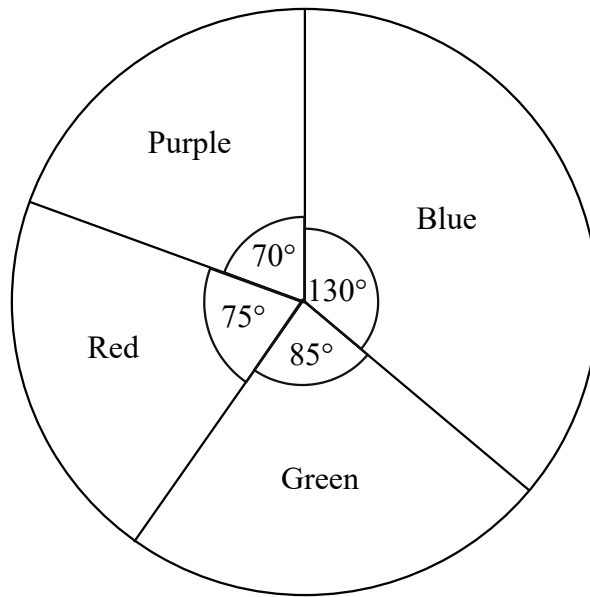
17 of the people said that green was their favourite colour.

Work out how many people said that blue was their favourite colour.

....

(Total for Question 11 is 2 marks)

12

1 dollar = 0.92 euros

(a) Change 350 dollars into euros.

.... euros

(b) Change 200 euros into dollars.

.... dollars

(Total for Question 12 is 2 marks)

13   The drawing shows the positions of three towns *A, B* and *C* on a map.

8 cm   15 cm

A   B   C

The map has a scale of 1 cm = 2.5 km

Work out the real distance between town *A* and town *C*.
Give your answer in kilometres.

.... km

(Total for Question 13 is 2 marks)

14 Cameron has some coins with a total value of 95 pence.

She has only 2 pence coins and 5 pence coins.
The ratio

number of 2 pence coins : number of 5 pence coins = 2 : 3

Work out how many 5 pence coins Cameron has.

....

(Total for Question 14 is 4 marks)

15 The scale drawing shows the positions of two towns *A* and *B*.

North

North

A

B
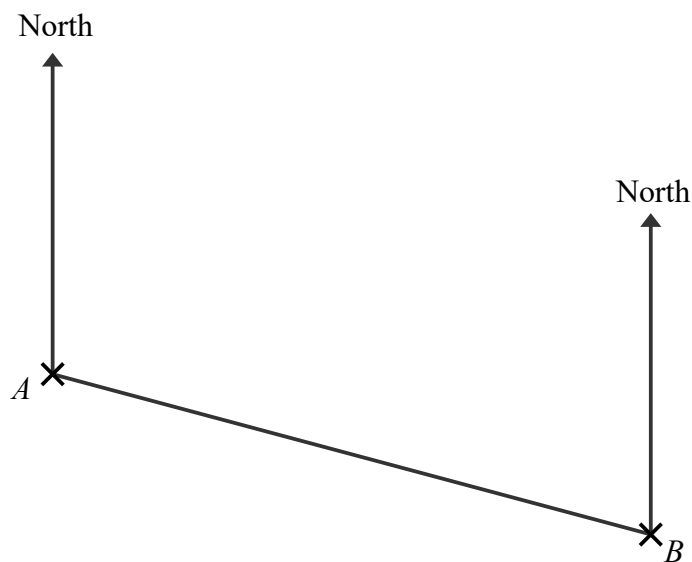
Find the bearing of *A* from *B*.

°
....

(Total for Question 15 is 2 marks)

16 60 students study a language at a school.
Each student either studies French or German.

36 of the students are boys.

$\frac{2}{3}$ of the boys study French

40 students study French

Use this information to complete the frequency tree.

boys

French

German

girls
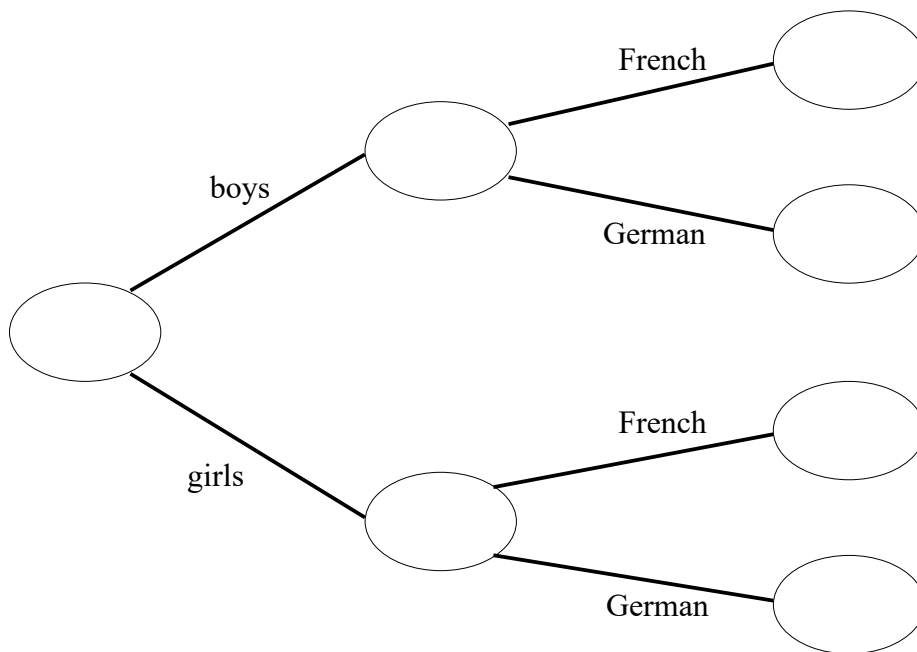
French

German

(Total for Question 16 is 4 marks)

17   (a) Factorise $3a^2 + 4ab$

....

(1)

(b) Solve $3(g + 9) = 21$

$g =$ ....

(2)

(Total for Question 17 is 3 marks)

18   Debbie buys 4 packs of oats.
Each pack contains 750 grams of oats.

The total cost of the 4 packs is £9.20

Work out the cost per 100g of oats.
Give your answer correct to the nearest penny.

.... p

(Total for Question 18 is 4 marks)

19   The diagram shows a solid prism.

10 cm

9 cm

x cm

8 cm

15 cm
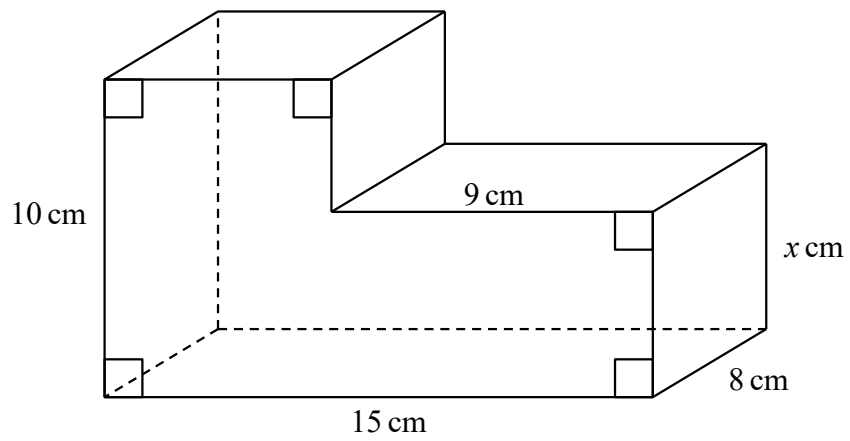
The volume of the prism is 804 cm³
Work out the value of *x*

....

(Total for Question 19 is 4 marks)

20 The frequency table shows the time taken for 100 people to travel to an event.

Time (minutes)	Frequency
$0 < t \leqslant 10$	14
$10 < t \leqslant 20$	16
$20 < t \leqslant 30$	23
$30 < t \leqslant 40$	29
$40 < t \leqslant 50$	12
$50 < t \leqslant 60$	6

Draw a frequency polygon to show this information.
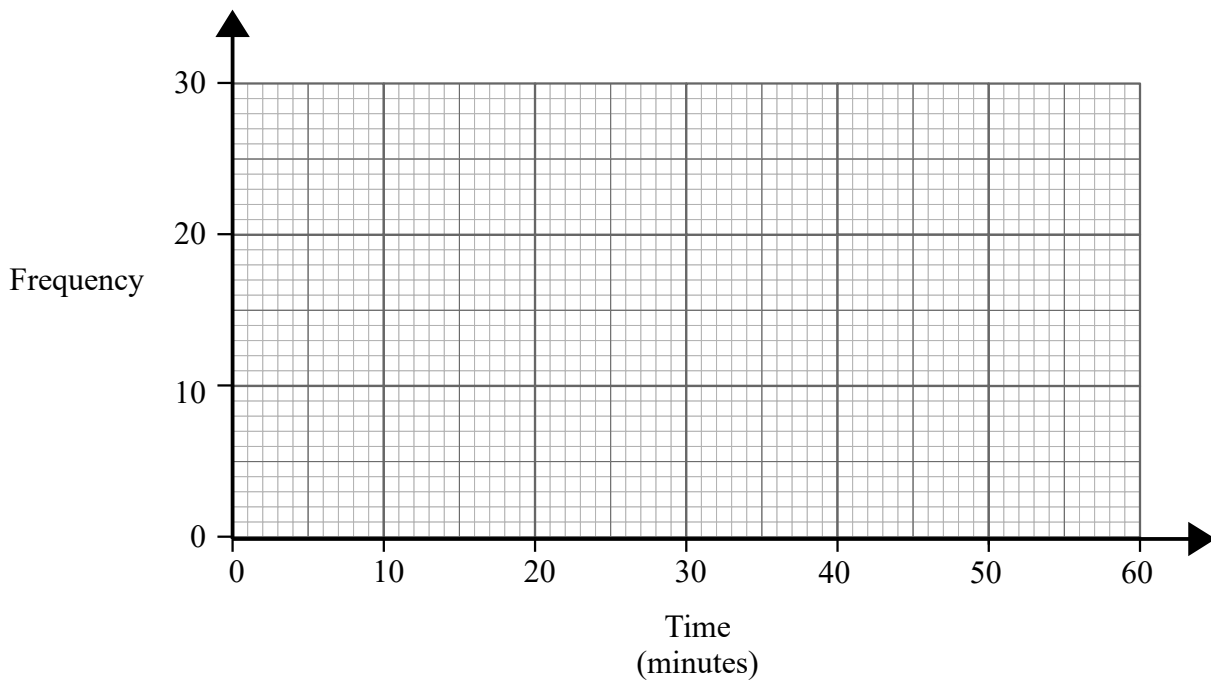
(Total for Question 20 is 2 marks)

21 Bradley gets the bus on Saturday and Sunday.
The probability that Bradley's bus will be late on any day is 0.15

Bradley draws this probability tree diagram.
The diagram is not correct.

Saturday   **Sunday**

0.85 — Bus is late

Bus is late

0.15

0.15 — Bus is not late

0.15 — Bus is late

0.75 — Bus is not late

0.15

0.85 — Bus is not late

Write down two things that are wrong with the probability tree diagram.

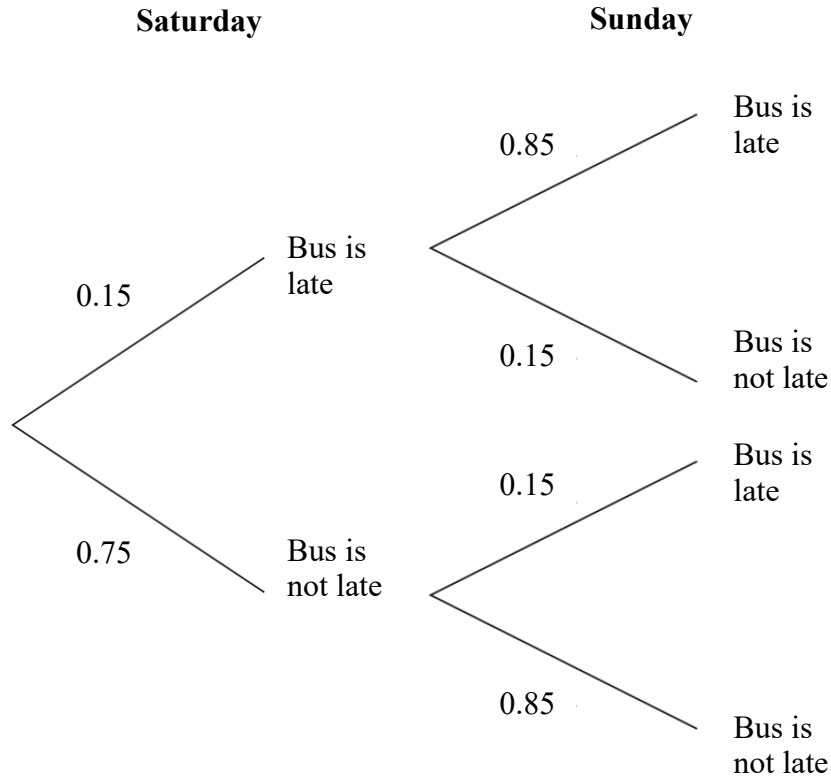1 ....

....

....

2 ....

....

....

(Total for Question 21 is 2 marks)

22   Matt wants to invest £8000 for three years. He can choose between Bank A and Bank B.

| **Bank A**	**Bank B**
1.2% compound interest per annum	2% compound interest in the first year 1% compound interest for each extra year

Which bank will give Matt the most interest after three years.
You must show your working.

23 The average daytime temperature for 10 days is recorded.
A shop also records its ice cream sales for each of the 10 days.

The scatter graph shows this information.
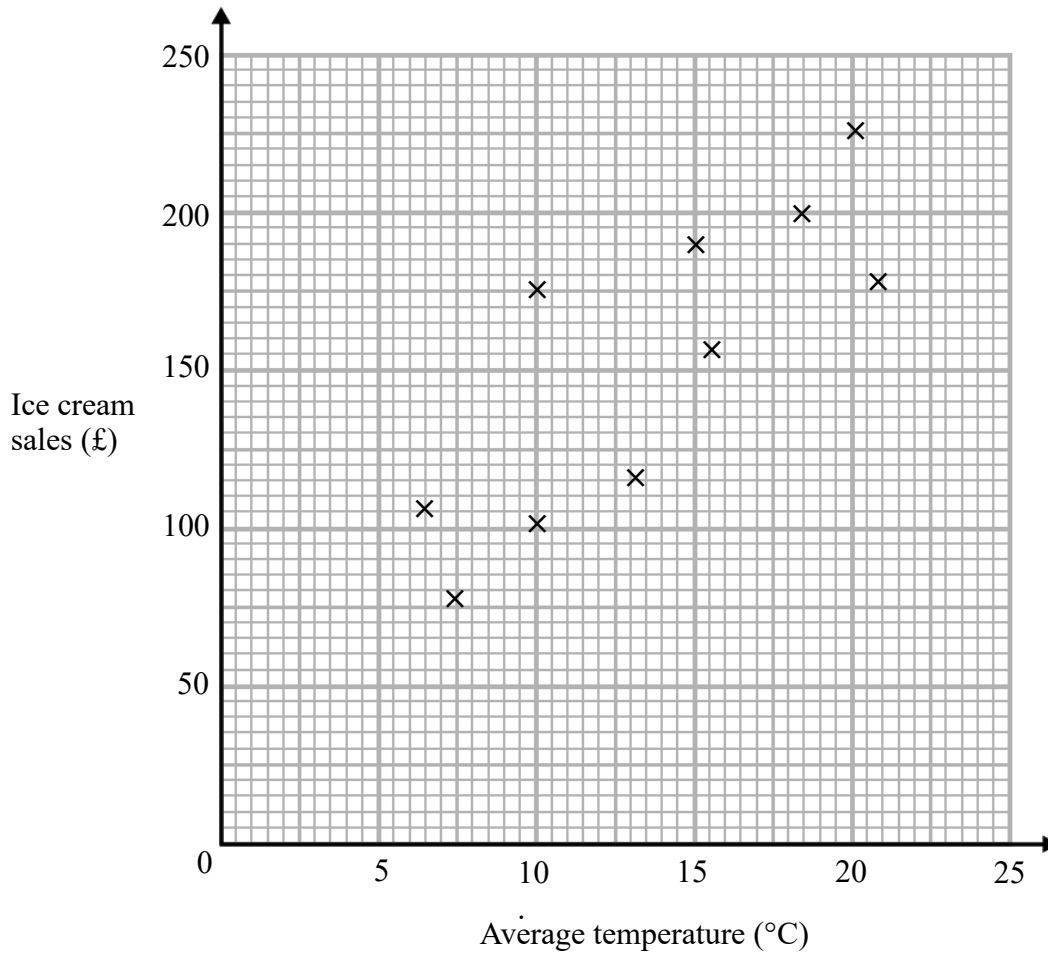
(a) What type of correlation does the scatter graph show?

....

(1)

(b) On the 11ᵗʰ day the temperature was 12°C.
Estimate the ice cream sales on the 11th day.

£...

(2)

(c) The shop's manager wants to use the scatter graph to predict the ice cream sales for a day with
an average temperature of 2°C. Comment on the reliability of this prediction.

....

....

(1)

(Total for Question 23 is 4 marks)

24   Find 5% of 3.8×10^{105}
         Give your answer in standard form

....

(Total for Question 24 is 3 marks)

25   Verity buys 12 bottles of apple juice for a total cost of £15
         Verity sells all 12 bottles at £1.75 each bottle.

         Work out Verity's percentage profit.

.... %

(Total for Question 25 is 3 marks)

26 $y^2 \times y^a = y^7$

(a) Find the value of a.

....

(1)

$(y^4)^b = y^{12}$

(b) Find the value of b.

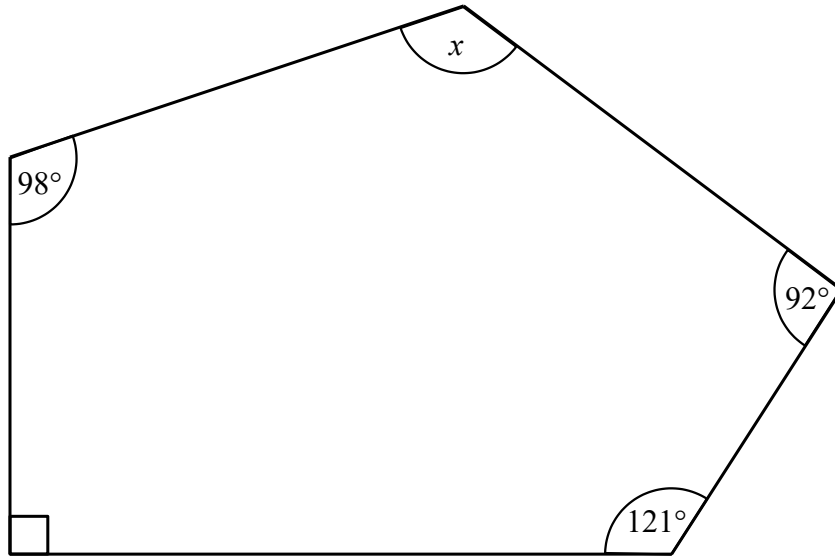...

(1)

(Total for Question 26 is 2 marks)

27   Change a speed of 81 kilometres per hour to a speed in metres per second

.... m/s

(Total for Question 27 is 3 marks)

28 The diagram shows a pentagon.

Work out the value of x

....

(Total for Question 28 is 3 marks)

29   The density of orange cordial is 1.21 grams per cm^3.

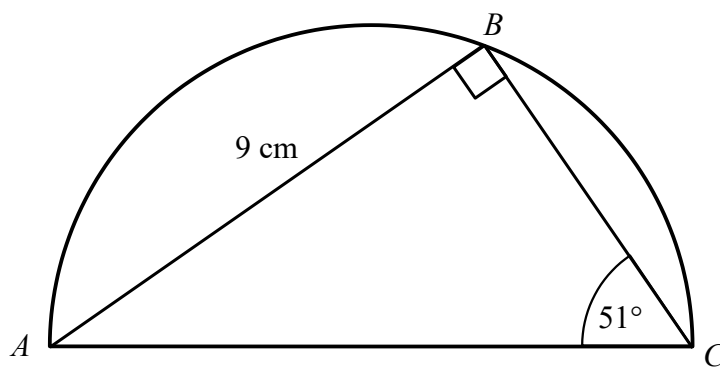The density of carbonated water is 1.01 grams per cm^3.

A drink with a volume of 280 cm^3 is made by mixing 1 part of orange cordial with 7 parts of carbonated water.

Work out the density of the drink.

.... g/cm^3

(Total for Question 29 is 4 marks)

30   The diagram shows a triangle ABC inside a semicircle.

Work out the perimeter of the semicircle.
Give your answer correct to 3 significant figures.

....

(Total for Question 30 is 5 marks)

31   Solve $x^2 + 3x - 54 = 0$

....

(Total for Question 31 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS