



General Certificate of Secondary Education

Centre Number

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Candidate Number

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Mathematics

Unit M7 Paper 2
(With calculator)

Higher Tier



[GMC72]
Assessment

GMC72

TIME

1 hour 15 minutes.

Assessment Level of Control:

Tick the relevant box (✓)

Controlled Conditions	
Other	

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page, on blank pages or tracing paper.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all sixteen** questions.

All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions.

You **may** use a calculator for this paper.

INFORMATION FOR CANDIDATES

The total mark for this paper is 50.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

You should have a calculator, ruler, compasses and a protractor.

The Formula Sheet is on page 2.



Formula Sheet

Volume of prism = area of cross section \times length



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



Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

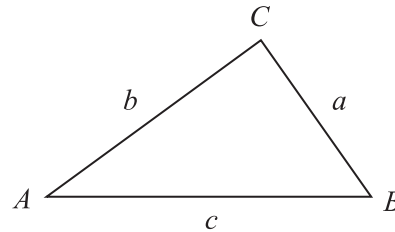


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



Quadratic Equation

The solutions of $ax^2 + bx + c = 0$
where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule: $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2} ab \sin C$



1 The map shows the position of four Underground Stations in London.

The symbol for an underground station is 



Map Scale 1 cm = 100 m

(a) Calculate the **actual distance** between Goodge Street Underground Station and Holborn Underground Station.

Show your working clearly.

Answer _____ m [2]

(b) Great Ormond Street Children's Hospital is 550 m due North of Holborn Underground Station.

Mark the exact position of the hospital with an X.

[2]

[Turn over



2 Jenny's height is given as 156 cm, correct to the nearest cm.

Between what limits does Jenny's height lie?

Complete the following:



_____ \leq Jenny's height $<$ _____

[2]

3 Laura paid for meals, while on holiday in Spain, with her credit card.

The cost was €91.48

£1 = €1.12

(a) What was the cost in £?

Answer £ _____ [2]

(b) Laura's bank charged her 2.7% of this cost in £ for a non-sterling transaction.

How much was this charge in £?

Answer £ _____ [2]



4 In a herd of 40 goats there are
8 brown 9 white 13 without horns



A goat is taken at random from the herd.

What is the probability that this goat

(a) has horns,

Answer _____ [1]

(b) is brown or white,

Answer _____ [1]

(c) is not brown or white?

Answer _____ [1]

[Turn over



5

	Pancake mix for four people	Pancake mix for ten people
Flour	200g	g
Milk	350ml	ml
Eggs	2	
Vegetable oil	1 tablespoon	tablespoons

The table above shows the ingredients required to make pancakes for four people.

Complete the table to show how much of each ingredient would be required for ten people.

[2]



6 (a) Fill in the next term in the following sequence.

2, 3, 5, 8, 13, 21, _____ [1]

(b) What rule did you use to find this term?

Answer _____ [1]



7 A box contains sweets.

The sweets are strawberry, lime, orange or blackcurrant flavour.

A sweet is taken at random from the box.

The table below shows some of the probabilities.

Flavour	strawberry	lime	orange	blackcurrant
Probability	0.45			0.25

(a) The box has an equal number of lime and orange sweets.

Work out the probability that an orange sweet will be taken.

Answer _____ [2]

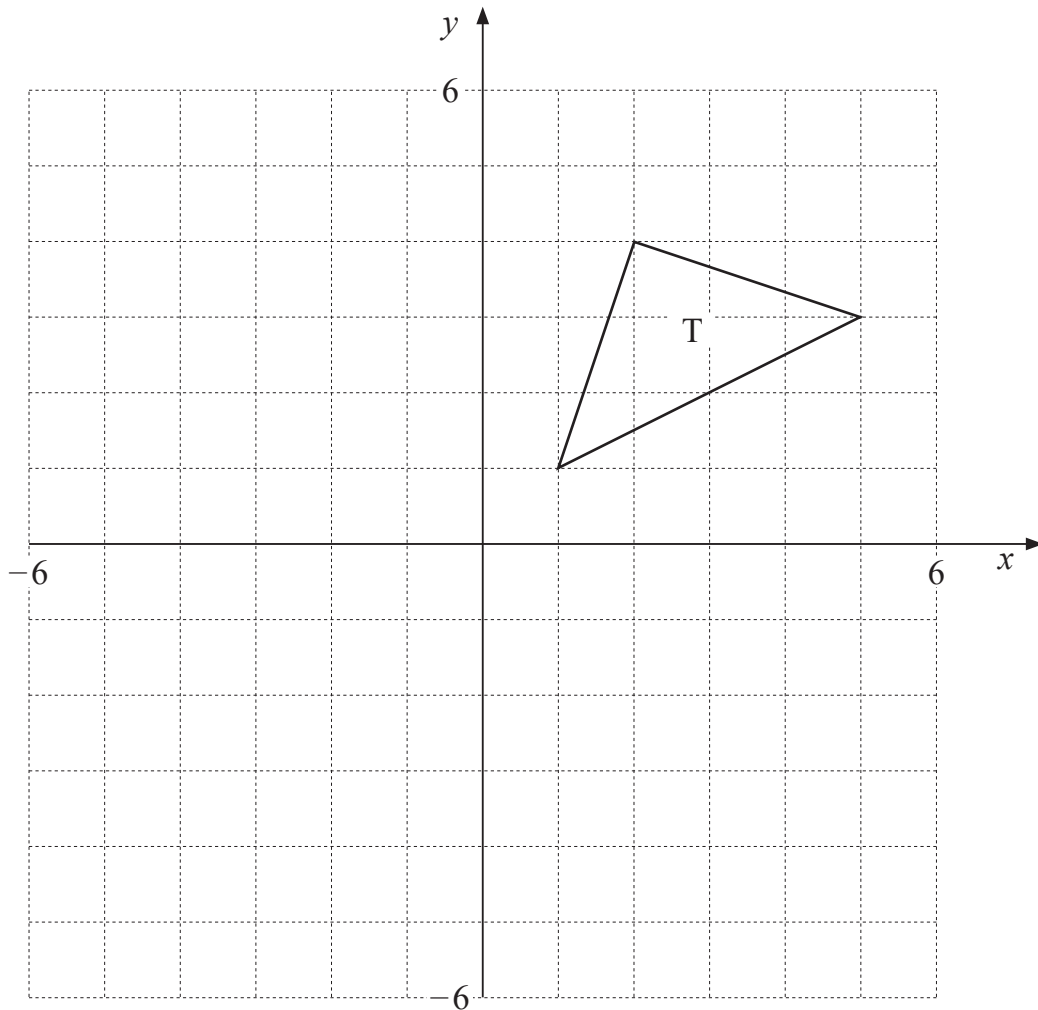
(b) The box contains a total of 120 sweets.

How many strawberry sweets should it contain?

Answer _____ [2]



8



- (a) Draw the image of the triangle, T, after a translation of 4 units to the left and 5 units down.
Label the image P.

[1]

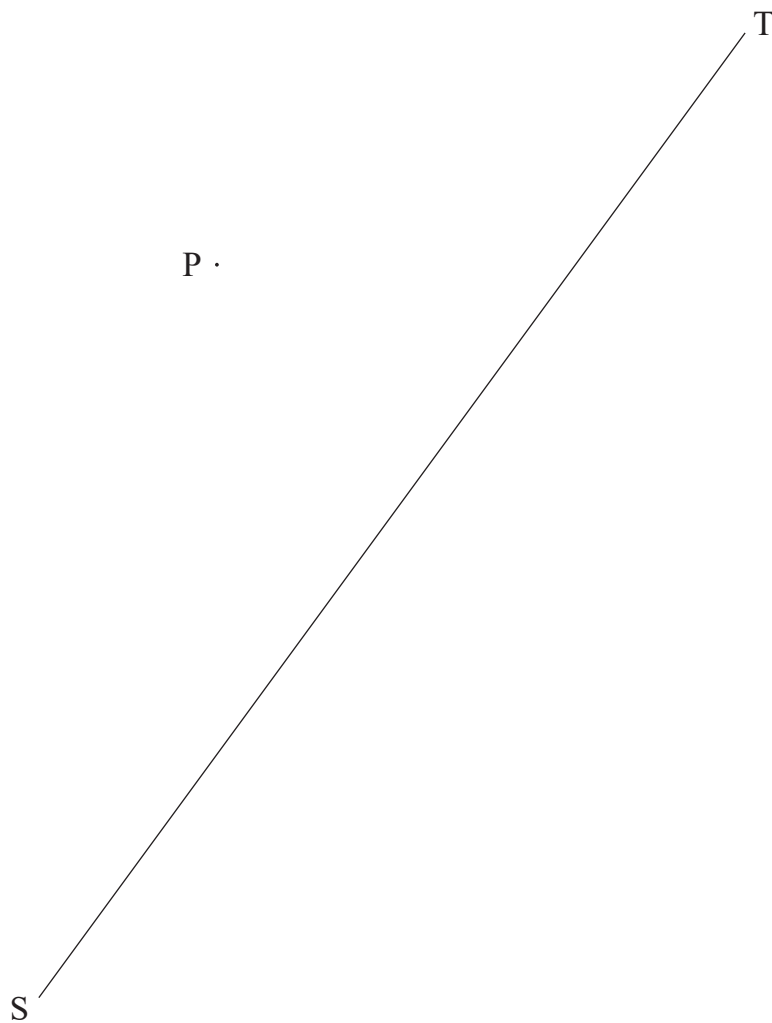
- (b) Draw the image of the triangle, T, after a rotation of 90° anti-clockwise about the origin.
Label the image Q.

[3]

[Turn over



- 9 Construct the line which represents the shortest distance from point P to the line ST in the diagram below.



[2]

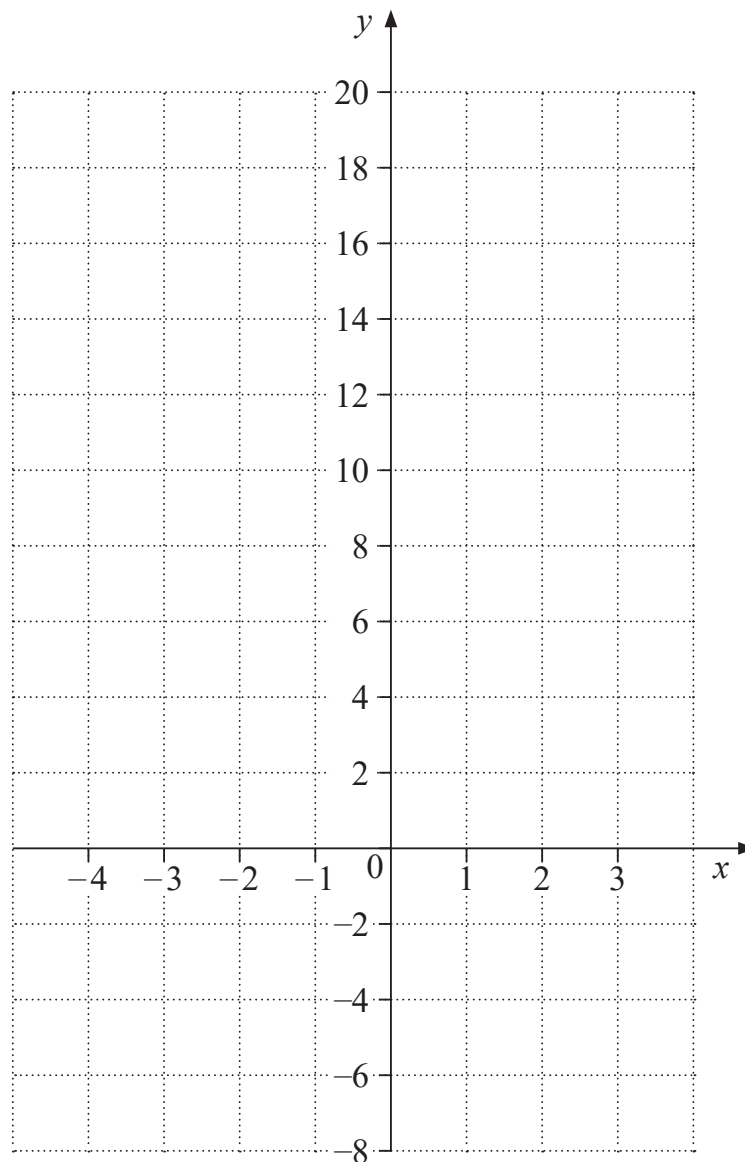


11 (a) Complete the table of values for $y = 3x^2 + 6x - 4$

x	-4	-3	-2	-1	0	1	2
y	20	5	-4		-4	5	20

[1]

(b) Hence, draw the graph of $y = 3x^2 + 6x - 4$ on the grid below.



[2]

(c) Draw the line $y = 12$ on the grid.

Write down the x values of the points of intersection with this line.

Answer _____, _____ [2]



12 Write the binary number 1011001 as a decimal number.

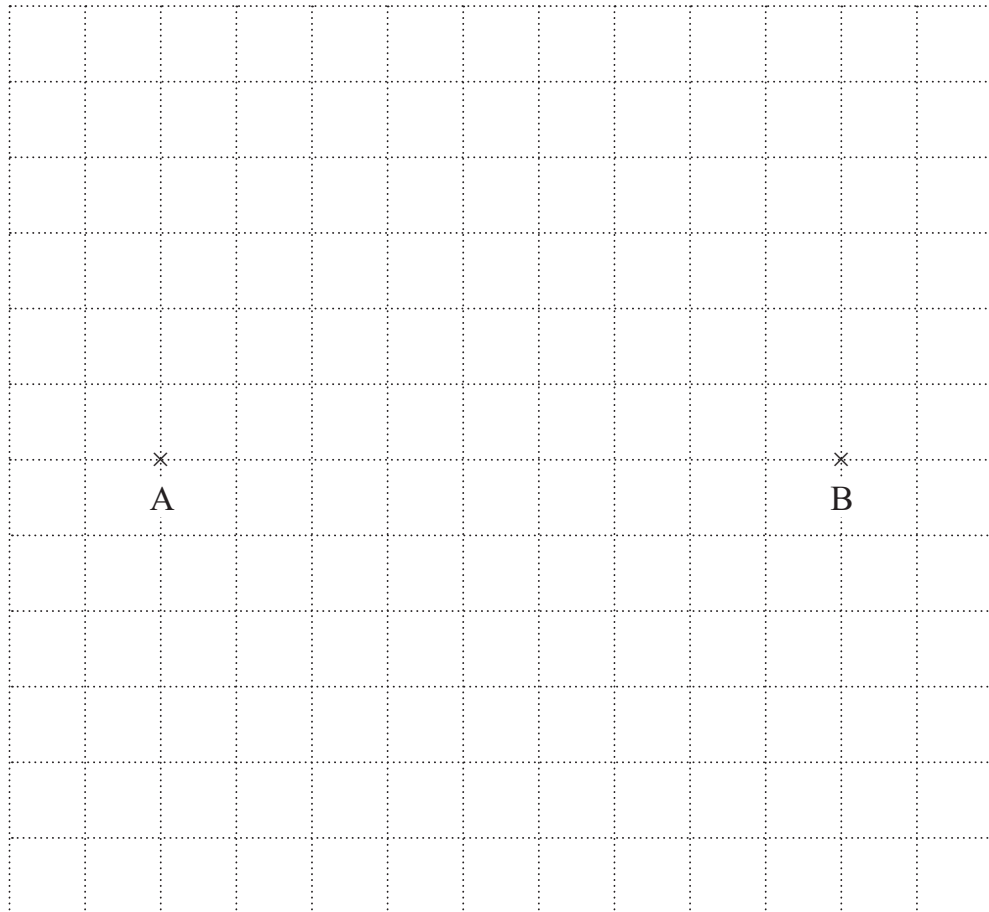
Answer _____ [1]



13 Two transmitters are located at points A and B, 9 metres apart.

The best reception is an area which is less than 6 metres from A and closer to B than to A.

Shade this area on a scale drawing below, using a scale of 1 cm to 1 metre.



[3]



14 A piece of land in the shape of a rectangle has a length of 8.3×10^6 centimetres and a width of 3.7×10^4 centimetres.

(a) Work out the area of the land, giving your answer in standard form.

Answer _____ cm^2 [1]

(b) Work out the perimeter of the land, giving your answer in standard form.

Answer _____ cm [2]



15 John earns $\pounds x$ per hour on Fridays and $\pounds y$ per hour on Saturdays.

In March he worked 20 hours on Fridays, 12 hours on Saturdays and earned $\pounds 322$

In April he worked 16 hours on Fridays, 10 hours on Saturdays and earned $\pounds 262$

Use simultaneous equations to find the values of x and y .

Answer $x =$ _____

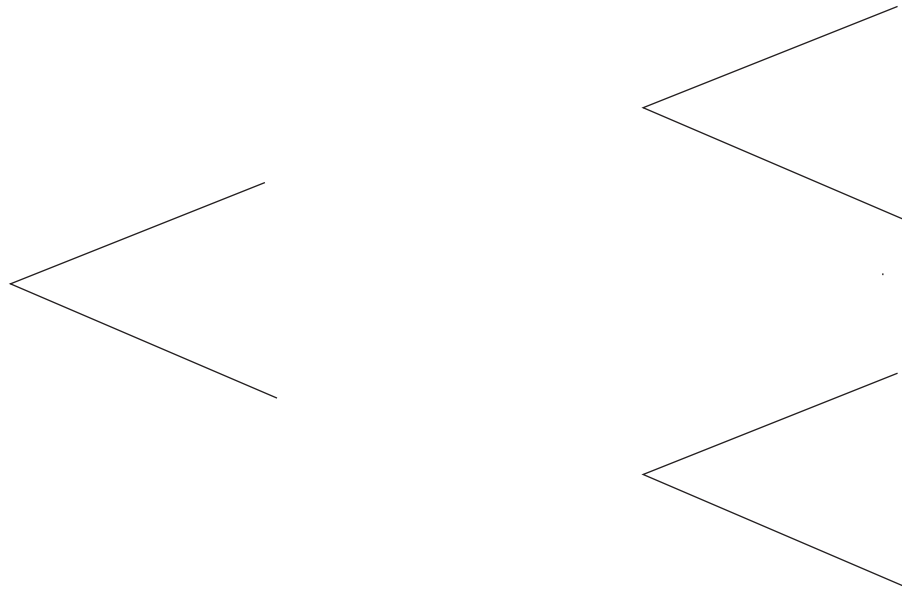
$y =$ _____ [5]



16 The probability of Fran's team playing their weekly game on a Friday is 0.1

The probability of Fran's team scoring first in a game is 0.75

Show this information on the tree diagram.



[3]

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For Examiner's use only	
Question Number	Marks
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Total Marks	
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Examiner Number

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