OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Secondary Education

MATHEMATICS SYLLABUS A 1962/3

PAPER 3 (Intermediate Tier)

Tuesday **7 JUNE 2005** Afternoon 2 hours

Candidates answer on the question paper.
Additional materials:
Geometrical instruments
Tracing paper (optional)

Candidate Name	Centre Number	Candidate Number

TIME 2 hours

INSTRUCTIONS TO CANDIDATES

- Write your name in the space above.
- Write your Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for working that shows that you know how to solve the problem even if you get the answer wrong.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.

WARNING

You are not allowed to use a calculator in this paper.

FOR EXAMINER'S USE

This question paper consists of 18 printed pages and 2 blank pages.

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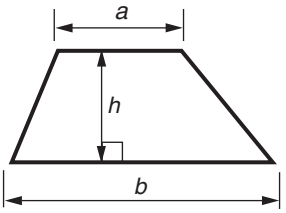
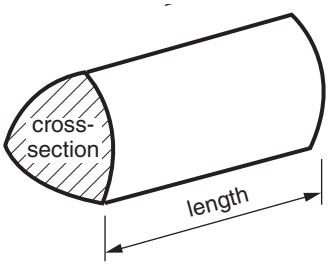
Formulae Sheet: Intermediate Tier

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



Volume of prism = (area of cross-section) × length



1 Work out.

(a) 2^3

.....

(a) _____[1]

(b) -2×-4

(b) _____[1]

(c) 0.8×0.2

(c) _____[1]

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2 **(a)** Simplify.

(i) $5p + 7s + 4p - 3s$

.....

(a)(i) _____[2]

(ii) $f \times f \times f \times f$

(ii) _____[1]

(b) Solve.

$$\frac{x}{3} = 6$$

.....

(b) _____[1]

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3 Some people were surveyed about washing clothes.
They all used both a detergent and a separate fabric conditioner.

Detergent was used in tablet, powder or liquid form.
Fabric conditioner was used in tablet or liquid form.

(a) Complete the table below to show the different possible combinations of detergent and fabric conditioner used.

		Detergent		
		Tablet (T)	Powder (P)	Liquid (L)
Fabric Conditioner	Tablet (T)		T, P	
	Liquid (L)			

[2]

(b) **(i)** One of the people in the survey is chosen at random.

Complete the table below to show the probability of that person using liquid detergent.

	Detergent		
	Tablet	Powder	Liquid
Probability	0.6	0.25	

.....[2]

(ii) There were 200 people in the survey.

How many of them might you expect to use a **tablet** detergent?

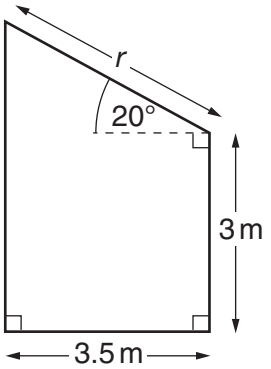
.....

.....

(ii) _____[2]

4 The diagram shows the side view of a building.

NOT TO SCALE



(a) Using a scale of 2 cm to represent 1 m, make an accurate drawing of the side view of the building.

[4]

(b) Use your scale drawing to find the **real** length *r*.

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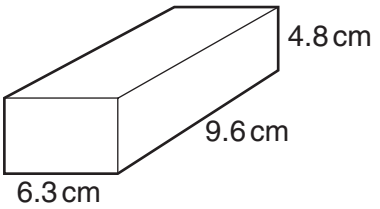
.....

(b) _____m [2]

5



Work out an **estimate** of the volume of the cuboid.
Show all your working clearly.

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.....

_____ cm^3 [4]

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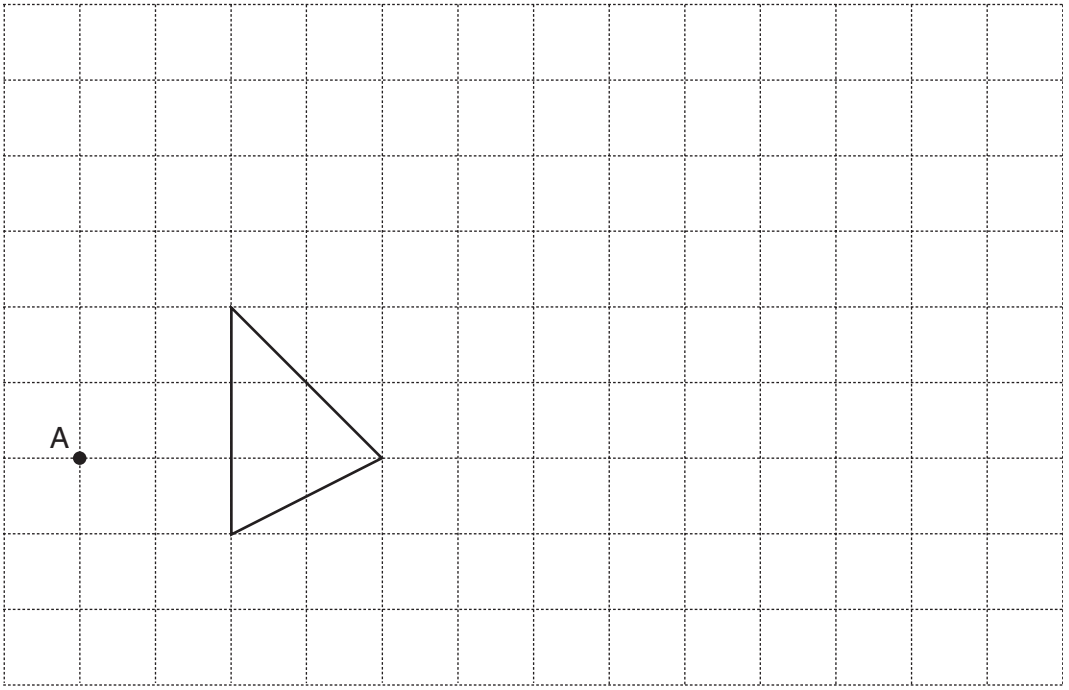
6 Enlarge the triangle by scale factor 2.
Use point A as the centre of enlargement.



[3]

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7 The cash price of a car is £6000.

Joseph bought this car on credit.

The credit terms were:

- Deposit of £250
- 12 payments of £600

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Details: An image of a car with a price tag of £6000 on it

(a) How much more than the cash price was the credit price?

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.....

(a) £ _____[4]

(b) When Joseph sold the car, its value had gone down by 30%.

The car was originally worth £6000.

How much did he sell it for?

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.....

.....

.....

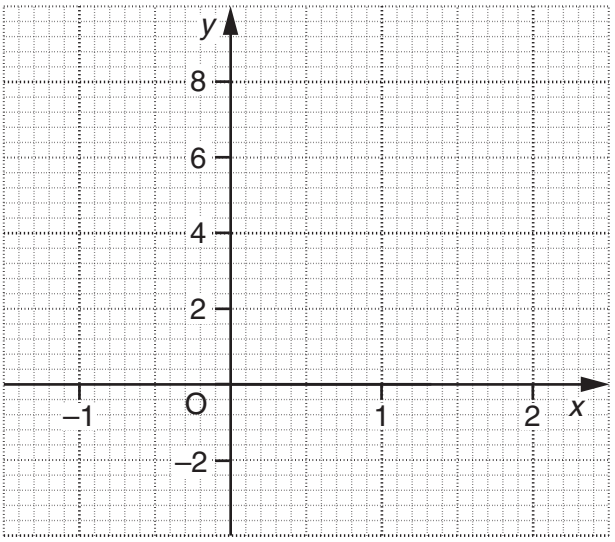
(b) £ _____[3]

8 **(a)** Complete the table below for $y = 3x + 1$.

x	–1	0	1	2
y	–2	1		7

[1]

(b) Draw the graph of $y = 3x + 1$.



[2]

(c) **(i)** On the same grid, draw the line $y = 6$. [1]

(ii) Hence, find the solution of the equation

$$6 = 3x + 1.$$

(c)(ii) _____[1]

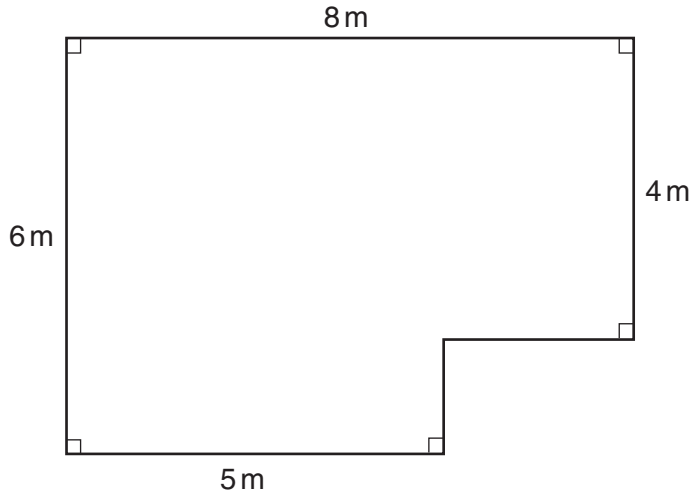
(d) **(i)** Write down the gradient of the straight line $y = 3x + 1$.

(d)(i) _____[1]

(ii) Write down the equation of another straight line which is parallel to the line $y = 3x + 1$.

(ii) _____[1]

9 The diagram below shows the plan of a classroom.



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Work out the perimeter and area of the classroom floor.

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Perimeter = _____m

Area = _____m^2 [4]

10 **(a)** To make an Hawaiian Cocktail for **two** people you need

120 ml of coconut milk
and 150 ml of pineapple juice.

How much of each ingredient is needed to make the cocktail for **five** people?

.....

.....

.....

(a) coconut milk _____ ml

pineapple juice _____ ml [2]

(b) The pineapple juice is measured as 150 ml, correct to the nearest ml.
Explain why this volume of pineapple juice could be 149.5 ml.

_____

_____[1]

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11 To hire a bicycle, Jack pays £20 deposit plus £3 an hour.
He hires a bicycle for h hours.

(a) Write down a formula for the amount, £P, Jack pays.

(a) P = _____[1]

(b) Jack pays £38 to hire the bicycle.
Write down an equation and solve it to find the number of hours for which he hires the bicycle.

_____

_____

_____

_____

_____[2]

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12 Solve.

(a) $5(2x - 3) = 35$

.....

.....

.....

.....

.....

(a) _____[3]

(b) $\frac{x + 1}{3} = 5$

.....

.....

.....

(b) _____[2]

13 **(a)** There are red, green, blue and yellow counters in a bag.

A counter is taken from the bag at random.

The colour is recorded and then the counter is replaced.

This is repeated a number of times.

The table below shows the results.

Red	Green	Blue	Yellow
84	158	182	176

(i) What is the relative frequency of choosing a blue counter?

.....

.....

(a)(i) _____[2]

(ii) Emma thinks that there are fewer red counters in the bag than any other colour.

Is she right? Justify your answer.

_____

_____[1]

(b) A box contains 120 cubes.

Some of the cubes are black, the rest are white.

The black cubes and white cubes are in the ratio 2 : 3.

Calculate the number of black cubes and the number of white cubes in the box.

.....

.....

.....

.....

(b) black cubes _____

white cubes _____[3]

_____

14 **(a)** List the integer values of n for

$$3 \leqslant n < 8.$$

.....

(a) _____[2]

(b) Here are the first four terms of a sequence.

5 9 13 17

Which one of the expressions below gives the nth term of this sequence?
Explain your choice.

$n + 4$ $3n + 2$ $4n + 1$

.....

.....

.....

_____ because _____

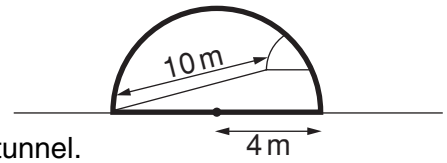
_____[2]

15 **In this question take the value of π to be 3.**

A tunnel is in the shape of a semi-circular prism.

The radius of the tunnel is 4 m.

The tunnel is 10 m long.



(a) Work out the volume of earth dug out to make the tunnel.
Give the units of your answer.

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(a) _____[4]

A thin line is painted **all the way** round the entrance to the tunnel.

(b) Work out the length of this line.

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.....

(b) _____m [3]

16 **(a)** Work out the reciprocal of $\frac{1}{2}$.

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(a) _____[1]

(b) Write 60 as a product of prime factors.

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.....

.....

(b) _____[2]

(c) Work out $3\frac{1}{2} \times 1\frac{3}{5}$.

Give your answer as a mixed number.

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.....

(c) _____[3]

17 **(a)** Simplify.

(i) $p^2 \times p^7$

.....

(a)(i) _____[1]

(ii) $\frac{t^8}{t^3}$

.....

(ii) _____[1]

(b) Multiply out the brackets and simplify your answer.

$$(x - 4)(x + 2)$$

.....

.....

.....

(b) _____[2]

(c) Rearrange the equation

$$y = x^2 + 5$$

to make x the subject.

.....

.....

.....

.....

(c) $x =$ _____[2]

18 The maximum temperature at a Mediterranean holiday resort was recorded each day for 100 days one summer.

The table below shows the distribution of temperatures.

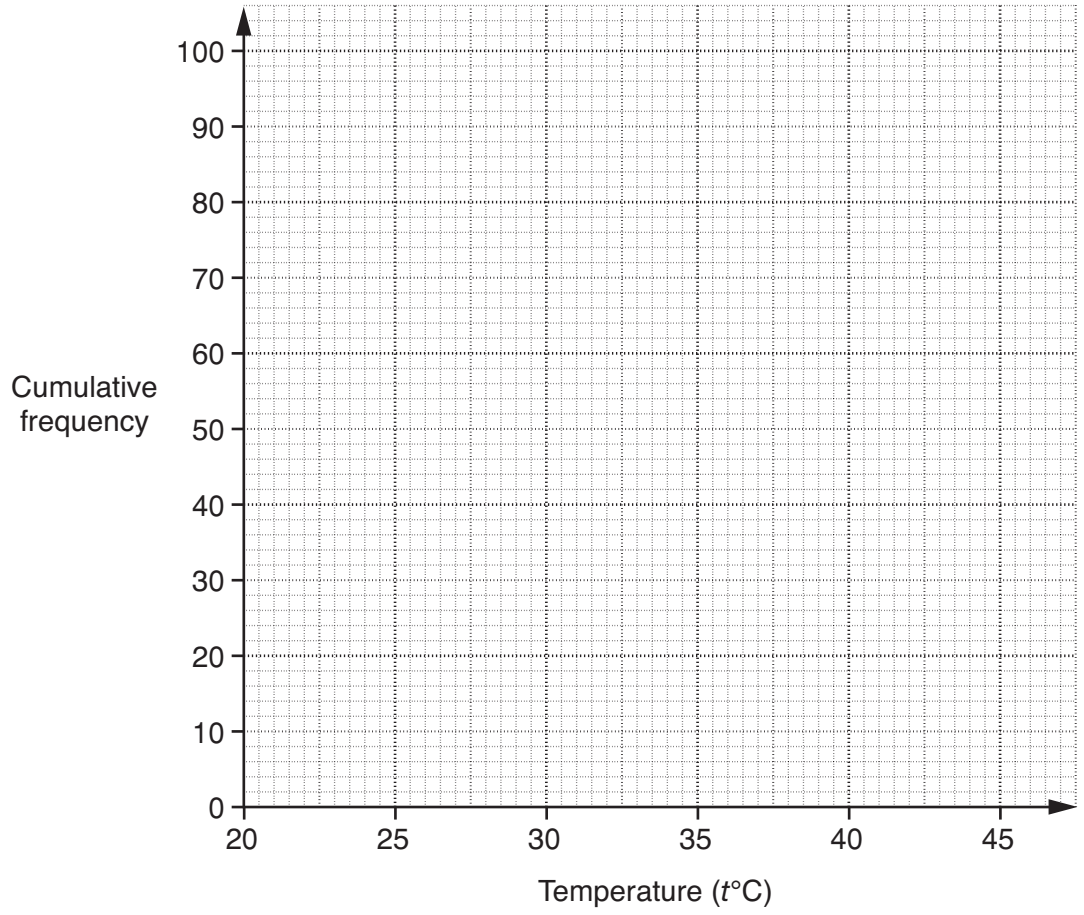
Temperature (t°C)	$20 < t \leqslant 25$	$25 < t \leqslant 30$	$30 < t \leqslant 35$	$35 < t \leqslant 40$	$40 < t \leqslant 45$
Frequency	12	24	37	21	6

(a) Complete the cumulative frequency table.

Temperature (t°C)	$t \leqslant 25$	$t \leqslant 30$	$t \leqslant 35$	$t \leqslant 40$	$t \leqslant 45$
Cumulative frequency	12				

[1]

(b) On the grid below draw a cumulative frequency diagram.



[3]

(c) **Use your graph** to find the median temperature.

(c) _____°C [1]

(d) **Use your graph** to estimate the number of days with a maximum temperature of 38 °C or less.

(d) _____[1]

19 (a) A company puts a logo on the cars it makes.

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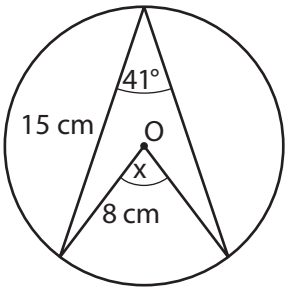
Details: An image of a car

The diagram shows the logo for cars. O is the centre of the circle.



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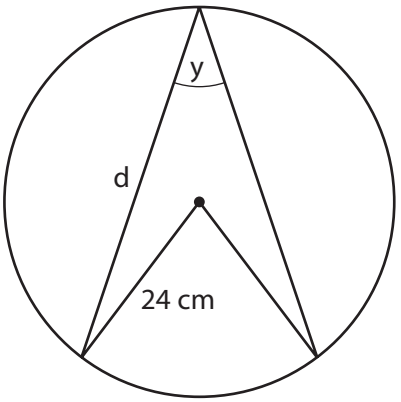
Find angle x.
Give a reason for your answer.

x = _____° because _____

_____[2]

(b) The company uses an enlargement of the logo on lorries that it makes.



NOT TO SCALE

(i) What is the size of angle y?

(b)(i) _____° [1]

(ii) Work out the length d.

.....

.....

.....

.....

(ii) _____ cm [3]

20 **(a)** Write 3.85×10^4 as an ordinary number.

.....

(a) _____[1]

(b) Write 0.0079 in standard form.

.....

(b) _____[1]

(c) Work out $(4 \times 10^6)^2$.

Give your answer in standard form.

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(c) _____[2]

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