

MATHEMATICS PRACTICE PAPER
UNIT 1: NON-CALCULATOR
INTERMEDIATE TIER

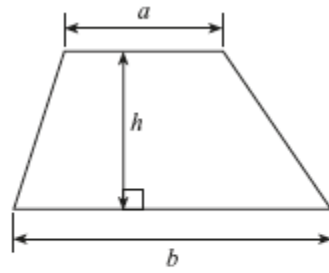
1 hour 45 minutes

(Linear papers –November 2015)

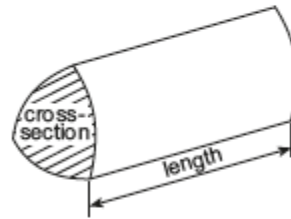
Question	Topic	Mark	Out of
1	Ratio and percentages		9
2	Angles		5
3	Scale and bearings		6
4	Fractions problem		5
5	Nth term		3
6	Probability from a table		9
7	Simplifying and solving equations		6
8	Electricity bill		9
9	Area of trapezium problem		4
10	Interior and exterior angles		4
11	Expand and simplify		4
12	Rearranging a formula		3
13	Drawing a graph from a table of values		7
14	Simultaneous equations		6
/Total			80

Formula List – Intermediate Tier

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



Volume of prism = area of cross-section \times length



1.

Brian makes bracelets and necklaces.
He threads small and large beads onto a chain.

- (a) The table below shows some information about the number of beads he uses.
Brian uses the same ratio of small and large beads for each bracelet and each necklace.
Complete the table. [3]

	Small beads	Large beads	Total number of beads
One bracelet	18	12	30
One necklace			150

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- (b) The table below shows the cost of the materials.

Materials	Cost
Small bead	5p
Large bead	10p
Bracelet chain	80p
Necklace chain	£2.95

A shop buys 100 bracelets from Brian.
Brian makes 70% profit on the cost of the materials.
Work out the total amount that the shop pays Brian for the bracelets.

[6]

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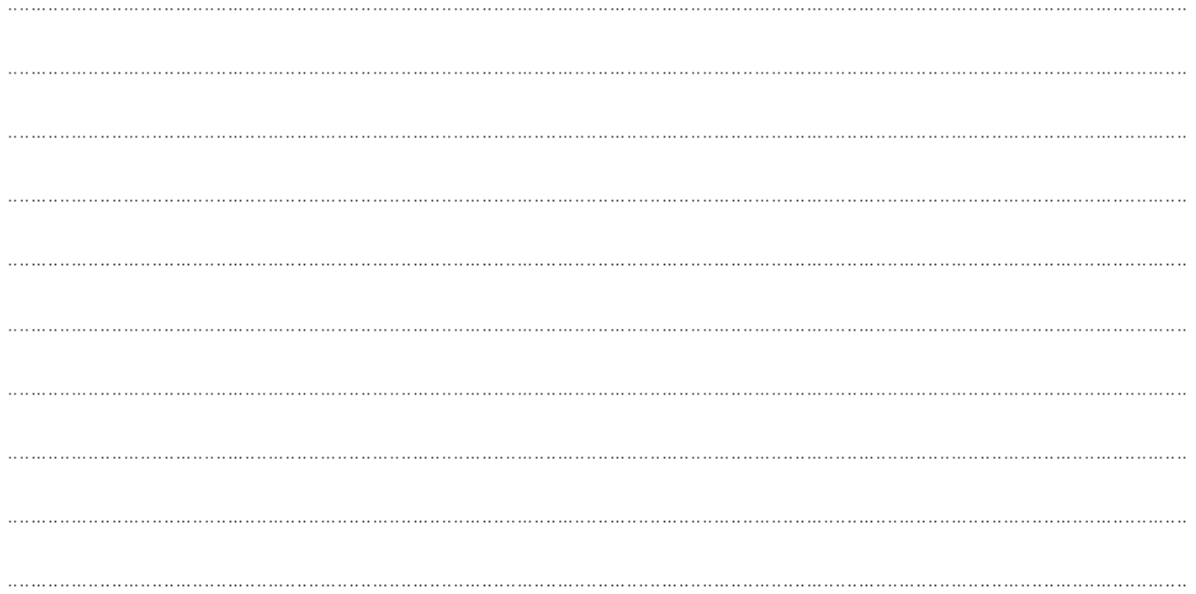
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2.

(a) Calculate the size of angle x .

[2]

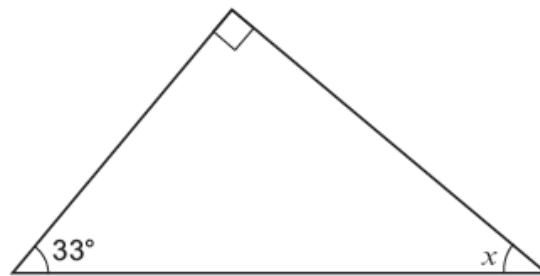


Diagram not drawn to scale

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$x = \text{.....}^\circ$

(b) $ABCD$ is a parallelogram. Calculate the size of angle y .

[3]

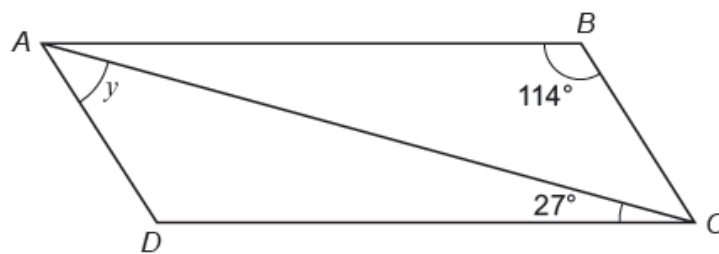


Diagram not drawn to scale

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$y = \text{.....}^\circ$

3.

(a) *A* and *B* are two rescue centres shown on a map with scale 1 cm = 5 km.

Measure and find the straight line distance, in km, from *A* to *B*.

[3]



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(b) A monument is on a bearing of 136° from *A* and on a bearing of 219° from *B*.
Plot the position of the monument and mark it *M*.

[3]

4.

Idris comes from a very large family.

He has many relatives, all of whom live in Canada, Japan or Wales.

$\frac{1}{5}$ of his relatives live in Canada, $\frac{3}{8}$ of his relatives live in Japan.

All 34 of his other relatives live in Wales.

How many relatives does Idris have altogether?

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5.

(a) The n th term of a sequence is $5n^2 - 3n$.

Write down the first three terms of the sequence.

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(b) Find the 20th term of the sequence with n th term $4n - n^2$.

[1]

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6.

In a survey, a total of 392 pupils were chosen from years 7, 8 and 9 and asked the following question.

What is your favourite sport in this list?

football	rugby	swimming	cycling
			

The results are summarised in the table below.

Favourite sports					
Year	Football 	Rugby 	Swimming 	Cycling 	Total
7	45	38	23	15	121
8	32	64	14	28	138
9	26	46	34	27	133
Total	103	148	71	70	392

In each of the following parts, a pupil is selected at random.

(a) Calculate the probability of selecting a pupil whose favourite sport is swimming. [1]

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(b) Calculate the probability of selecting a Year 8 pupil. [1]

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(c) The pupil selected is in Year 8.
Calculate the probability that this pupil's favourite sport is cycling. [2]

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(d) The favourite sport of the selected pupil is football. [2]
What is the probability that this pupil is in Year 7?

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(e) The pupil selected is **not** in Year 7. [3]
What is the probability that this pupil's favourite sport is **not** football?

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7.

(a) Solve $8x - 9 = 21 + 5x$. [3]

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(b) Simplify $6e - 4f - 10e - f$. [2]

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(c) Solve $\frac{x}{7} = 14$. [1]

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11.

(a) Expand and simplify $(2x + 7)(3x - 1)$. [3]

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(b) Simplify $\frac{(x+3)^{12}}{(x+3)^4}$. [1]

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12.

Make h the subject of the formula.
Give your answer in its simplest form. [3]

$$5p + 7h = 11q + 3p$$

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13.

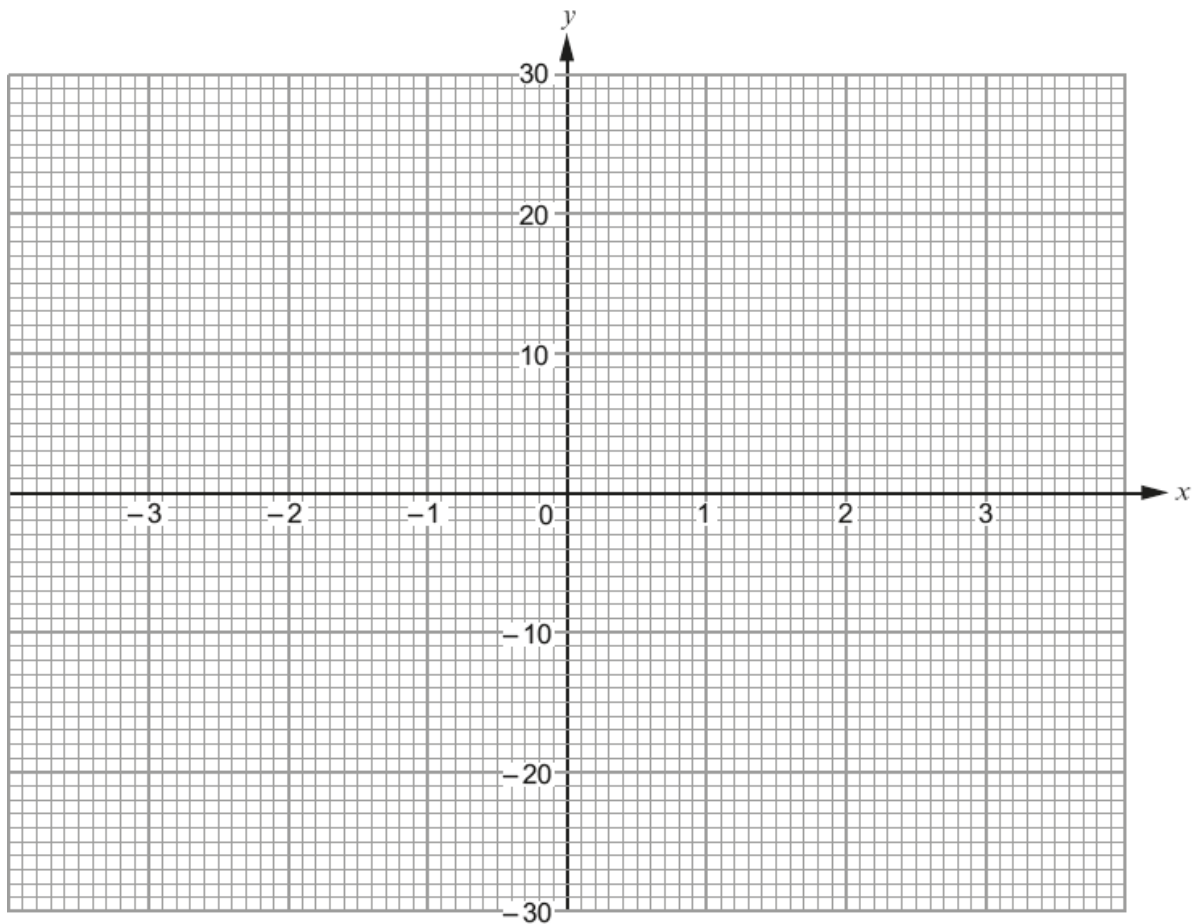
The table below shows some values of $y = x^3 - 3x + 4$ for values of x from -3 to 3 .

x	-3	-2	-1	0	1	2	3
$y = x^3 - 3x + 4$	-14		6	4	2	6	

(a) Complete the table above. [2]

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(b) On the graph paper below draw the graph of $y = x^3 - 3x + 4$ for the values of x from -3 to 3 . [2]



(c) Use your graph to write down the coordinates of the two points where the gradient is zero. [2]

(.....,) (.....,)

(d) Use your graph to write down the solution of the equation $x^3 - 3x + 4 = 0$. [1]

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