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Total Marks

[MATH(I1)05P1]

NATIONAL
QUALIFICATIONS

Time: 35 minutes

MATHEMATICS
INTERMEDIATE 1

Question Paper 1 (Units 1, 2, 3)
Non-calculator Paper

Fill in these boxes and read what is printed below.

Full name of school or college

Town

First name and initials

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Day Month Year

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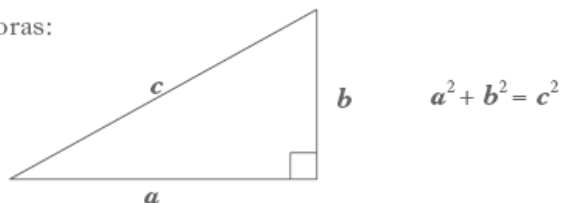
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Page one

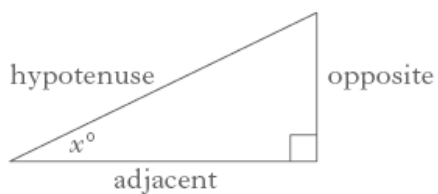
FORMULAE LIST

Circumference of a circle: $C = \pi d$
Area of a circle: $A = \pi r^2$
Curved surface area of a cylinder: $A = 2\pi r h$

Theorem of Pythagoras:



Trigonometric ratios
in a right angled
triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$
$$\sin x^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$
$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Marks

1. (a) Find $\frac{2}{3}$ of 156 apples

(1)

(b) Find 30% of £450.

(1)

2. Archie can clean 12 windows in 36 minutes.

(a) If he continues to clean at the same rate, how many windows can he clean in 2 hours?

(3)

(b) Serge also cleans windows. He can clean 58 windows in 3 hours. Who is quickest? Give a reason for your answer.

(2)

3. (a) Calculate w

$$12w+6=3w-30$$

(3)

(b) Factorise

$$24t + 18$$

(2)

[Turn over

Marks

4. To calculate the acceleration of a vehicle we can use the formula, $a = \frac{v-u}{t}$.
Calculate the acceleration, a, if $v=20$, $u=5$ and $t=3$.
5. In 1997 Kenya's population was 28,400,000
Express this number in standard form.
6. The fish tank in a pet shop contains 4 puffer fish, 5 fancy guppies and 7 goldfish. The tank has to be cleaned.

What is the probability that the first fish taken out of the tank is a puffer fish, assuming the fish are equally easy to catch?
7. (a) Tom left Gretna Green at 06:45 and arrived in Glasgow at 08:15
How long did the journey take?

(2)

(2)

(1)

(1)

Marks

7. (continued)

- (b) The distance from Gretna Green to Glasgow is 90 miles
Calculate his average speed

(3)

8. (a) Multiply out the brackets and simplify:

$$5(2p + 3) - 3p$$

(2)

(b) Solve the inequality:

$$4m + 3 < 19$$

(2)

[Turn over

Marks

9. The temperature in Braemar is recorded each night. On Tuesday the temperature is -5°C . Calculate the temperature on Wednesday if it is 4°C lower.

(2)

10. Alex bought a mountain bike for £125. Shortly after, he sold the bike to his brother for £100.

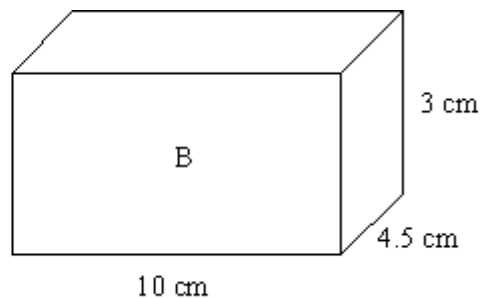
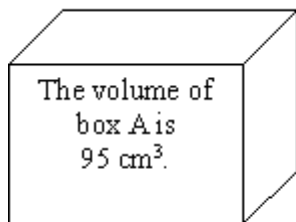
(a) Calculate how much Alex lost on the sale.

(1)

(b) Express this **loss** as a percentage of the **original price**.

(3)

11. A manufacturer currently uses box A to pack its products. Due to a change in their products, they need a box with a volume that is at least 40% bigger than box A.



(a) Calculate the volume of box B.

(2)

(b) Is Box B at least 40% bigger than box A? (you must justify your answer)

(1)

[END OF QUESTION PAPER]

(34)

Marks

ADDITIONAL SPACE FOR ANSWERS

--

Marks

ADDITIONAL SPACE FOR ANSWERS

--

perfectpapers

Total Marks

[MATH(I1)05P1A]

NATIONAL
QUALIFICATIONS

Time: 35 minutes

MATHEMATICS
INTERMEDIATE 1

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Non-calculator Paper

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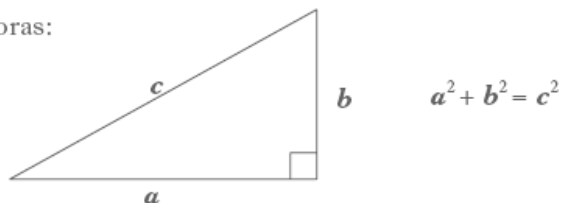
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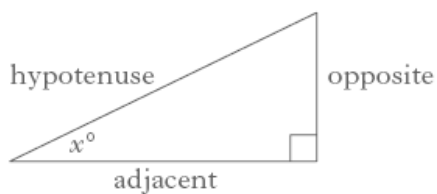
FORMULAE LIST

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Curved surface area of a cylinder: $A = 2\pi rh$

Theorem of Pythagoras:



Trigonometric ratios
in a right angled
triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$
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(b) Find 30% of £450.

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2. Archie can clean 12 windows in 36 minutes.

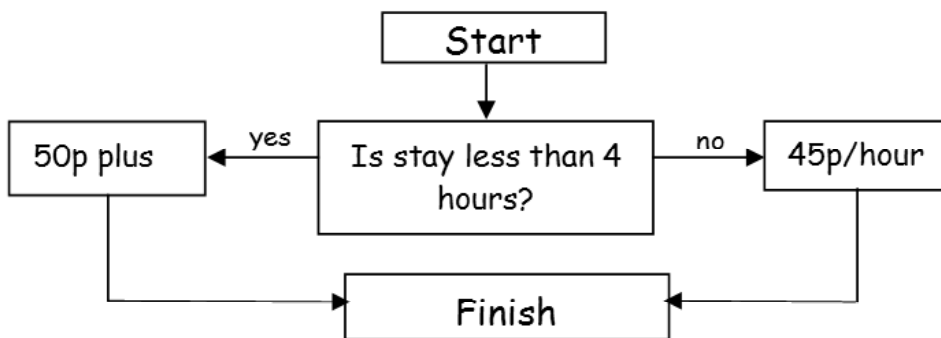
(a) If he continues to clean at the same rate, how many windows can he clean in 2 hours?

(3)

(b) Serge also cleans windows. He can clean 58 windows in 3 hours. Who is quickest? Give a reason for your answer.

(2)

3. The following chart shows how to calculate the parking charges in a city centre car park.



Calculate the cost of 5 hour stay in the car park.

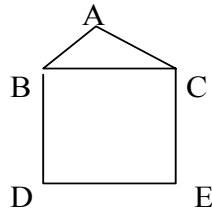
[Turn over (2)

Marks

4. To calculate the acceleration of a vehicle we can use the formula, $a = \frac{v-u}{t}$.
Calculate the acceleration, a, if $v=20$, $u=5$ and $t=3$.

(2)

5. Consider the following network diagram:



What is the order of the node at A?

(1)

6. The fish tank in a pet shop contains 4 puffer fish, 5 fancy guppies and 7 goldfish. The tank has to be cleaned.

What is the probability that the first fish taken out of the tank is a puffer fish, assuming the fish are equally easy to catch?

(1)

7. (a) Tom left Gretna Green at 06 45 and arrived in Glasgow at 08 15
How long did the journey take?

(1)

Marks

7. (continued)

- (b) The distance from Gretna Green to Glasgow is 90 miles
Calculate his average speed

(3)

8. Adam sails 20 km on a bearing of 080° . Whilst taking in the scenery, he drifts on a bearing of 150° for 8 km.

- (a) Make a scale drawing (using a scale of 1 cm:2 km) to represent the two parts of Adam's journey.

(3)

8. (b) Calculate the distance Adam has to sail to return to his starting point.

(2)

[Turn over

Marks

9. The temperature in Braemar is recorded each night. On Tuesday the temperature is -5°C . Calculate the temperature on Wednesday if it is 4°C lower.
10. Alex bought a mountain bike for £125. Shortly after, he sold the bike to his brother for £100.
- (a) Calculate how much Alex lost on the sale.
- (b) Express this **loss** as a percentage of the **original price**.
11. Alistair has conducted a survey on shoe sizes. He calculates that the lowest = 2, highest = 11, lower quartile = 3, Upper quartile = 8 and the median = 5.
- Show all this information in a boxplot in the space provided.

(2)

(1)

(3)

(2)

(30)

[END OF QUESTION PAPER]

Marks

ADDITIONAL SPACE FOR ANSWERS

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Marks

ADDITIONAL SPACE FOR ANSWERS

--

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Total Marks

[MATH(I1)05P2]

NATIONAL
QUALIFICATIONS

Time: 55 minutes

MATHEMATICS
INTERMEDIATE 1

Question Paper 2 (Units 1, 2, 3)

Fill in these boxes and read what is printed below.

Full name of school or college

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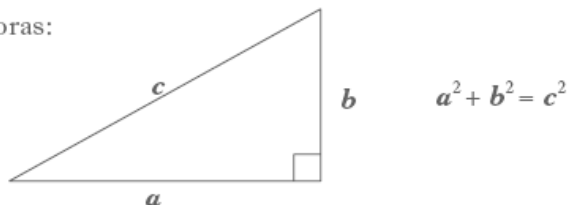
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Page one

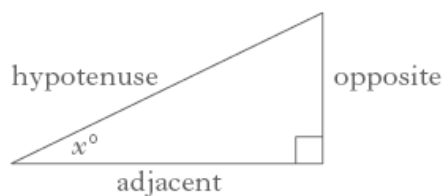
FORMULAE LIST

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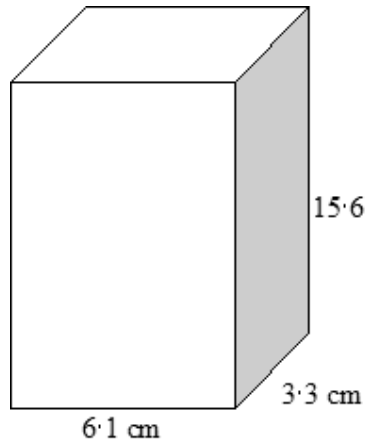
Trigonometric ratios
in a right angled
triangle:



$$\tan x^\circ = \frac{\text{opposite}}{\text{adjacent}}$$
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$$\cos x^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Marks

1. Find the volume of the following carton of juice. Round your answer to the nearest whole number.



2. Pat has been offered this waitering job with the following terms.

Waiter/Waitress required for busy restaurant. Hours: Mon – Fri, 6pm – 11.15pm Basic rate of pay is £4.20/hour .

- (a) Calculate Pat's weekly wage.
- (b) In addition, Pat works 4 hours overtime at **time and a half**. Calculate her overtime pay.

(2)

(3)

(2)

[Turn over

Marks

3. Janine has invested £15000 in a high interest account.
After 5 months, Janine withdraws her money from the account.
How much interest has been earned in that time?

Bank of Brandon

<u>Investment</u>	<u>Interest Rate(per annum)</u>
£2000 – £5000	4.5%
£5001 – £10000	5.7%
£10001 – £15000	7.2%
greater than £15000	8.8%

(3)

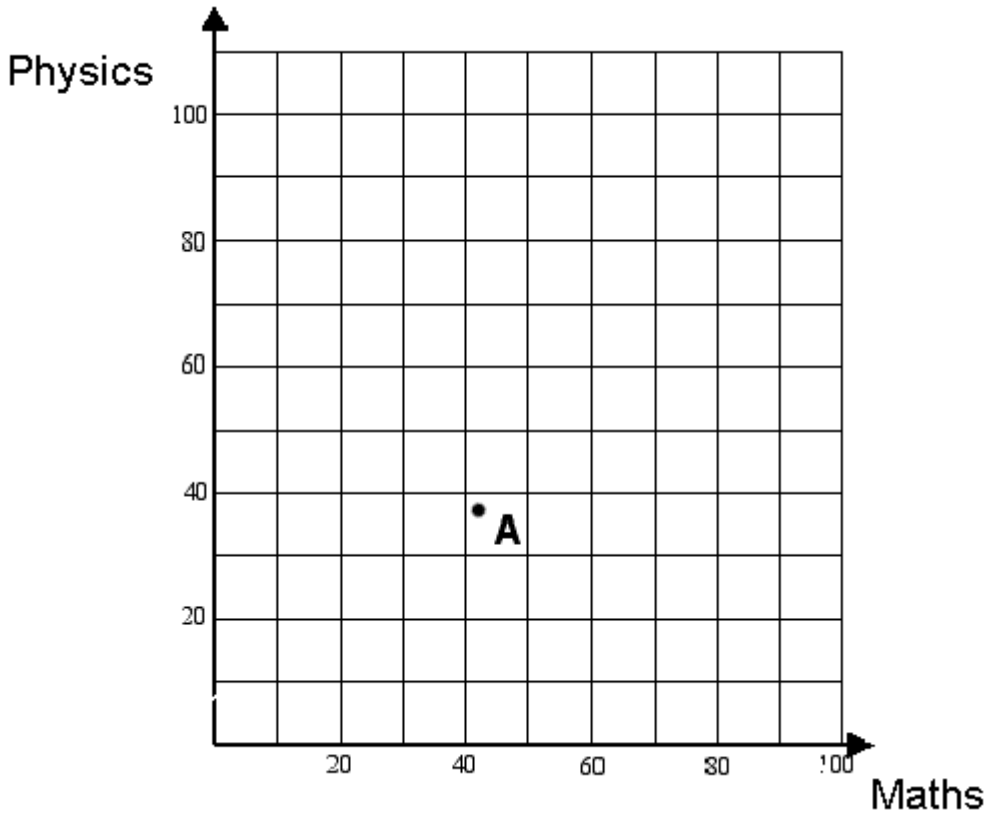
Marks

4. Ten pupils' marks are listed for their Maths and Physics tests.

The results are shown in this table.

Pupil	A	B	C	D	E	F	G	H	I	J
Maths	42	61	93	65	58	90	21	72	35	66
Physics	38	70	95	38	58	63	10	95	68	73

- (a) Display these results on the scattergraph below.
Pupil A has already been entered.



(3)

- (b) Draw a line of best fit for the points on the graph.

(1)

[Turn over

Marks

5. A company gives a bonus payment to each of the employees once a year. The bonus payments are shown in the table below

<i>Bonus (£)</i>	<i>Frequency</i>	<i>Bonus X Frequency</i>
350	5	1750
500	3	
750	2	
1000	7	
1500	4	
3000	4	
Totals		

(a) Which bonus represents the MODE?

(1)

(b) Complete the above frequency table.

(3)

(c) Calculate the MEAN from the totals in the frequency table.

(1)

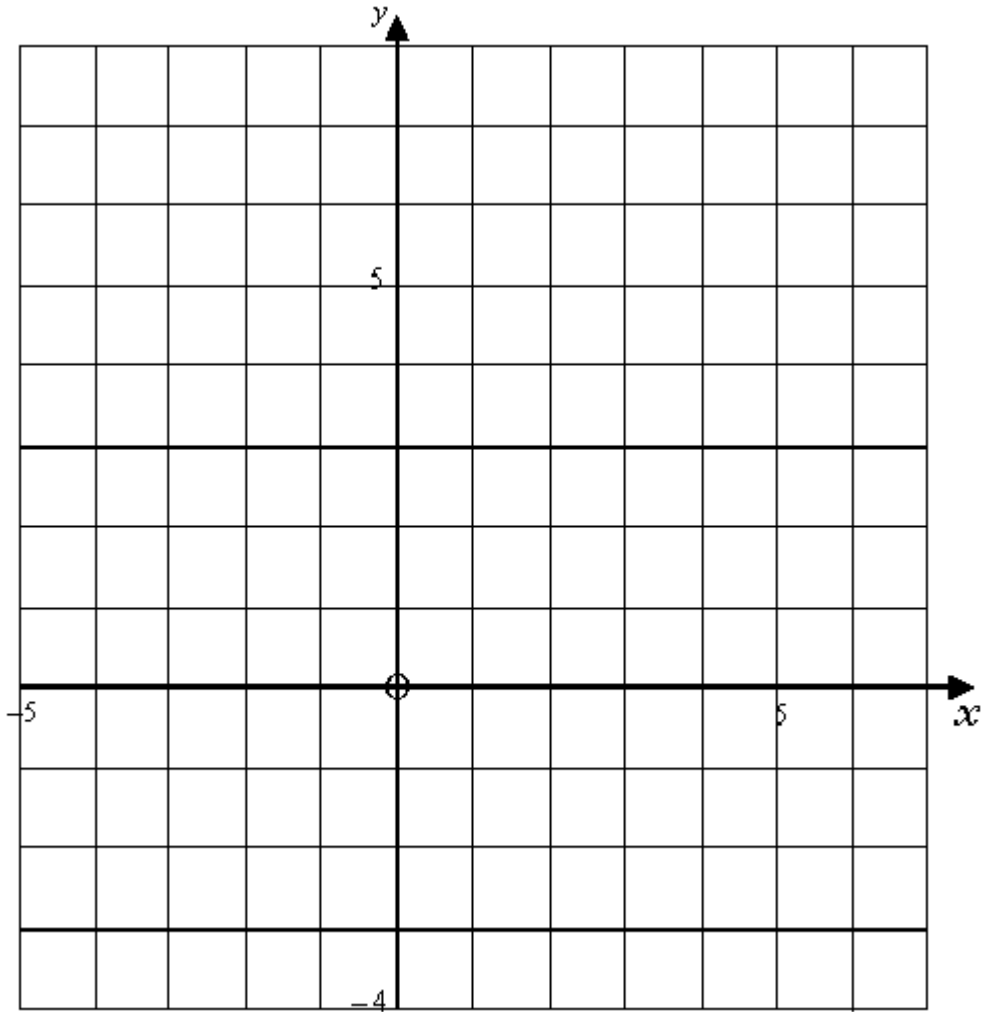
Marks

6. (a) Complete the table for $y = 4x + 2$

x	-1	0	1
y			

(2)

(b) Draw the line $y = 4x + 2$ on the grid below.

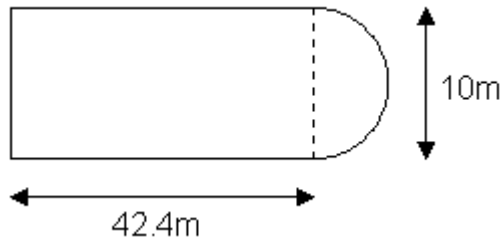


(2)

[Turn over

Marks

7. Mr Samson has designed a play area for children consisting of a rectangle and a semi circle as below. The rectangle measures 42.4 metres by 10 metres.



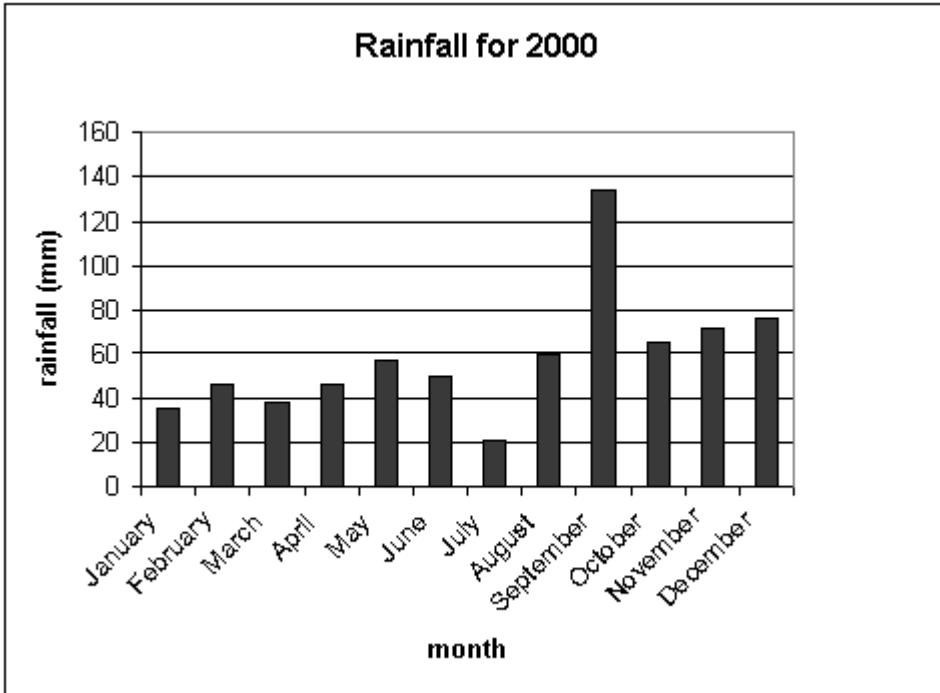
He wishes to build a fence around the play area.

Calculate how much fencing he will require.

(4)

Marks

8. Paul recorded the monthly rainfall at his home in Perth. He recorded the results on the graph below.



- (a) How much rain fell in August?
- (b) Which two months had the same amount of rain?
- (c) Which month had the least amount of rain?

(1)

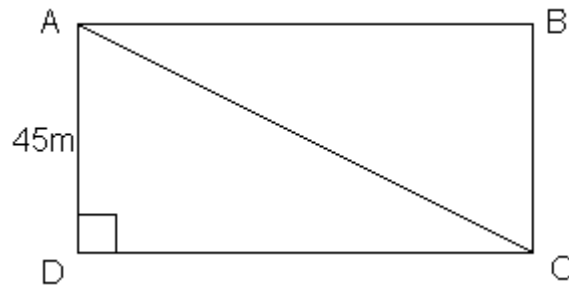
(1)

(1)

[Turn Over

Marks

9. The diagram below shows a football pitch which is twice as long as it is broad.
The breadth is 45m.



- (a) Write down the length of AB, the length of the football pitch. (1)
- (b) Calculate the distance AC, the distance between opposite corners. (3)

Marks

10. This formula is used to calculate the volume of a sphere.

$$V = \frac{4}{3}\pi r^3.$$

Calculate the volume when $\pi = 3.14$ and $r = 5.1$ cm.
Give your answer to the nearest 10.

(3)

11. Mr Johnson is going on holiday to Canada. He exchanges £1200 in to Canadian dollars at the exchange rate of £1 = \$2.54

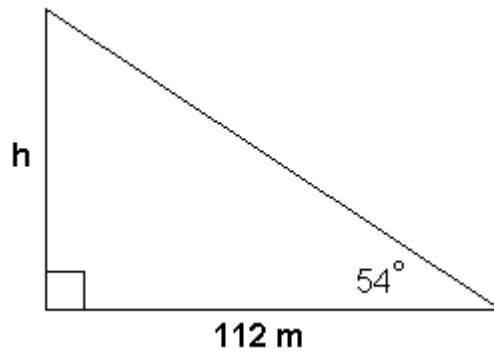
(a) Calculate how much Mr Johnson has in Canadian Dollars.

(b) On his return, Mr. Johnson discovers he has \$372 remaining. He changes this back to pounds at the rate of £1 = \$2.30. Calculate (to the nearest penny) how much Mr. Johnson has left.

(2)

[Turn over (3)

12. Calculate the height of the triangle, h .



Marks

(4)

[END OF QUESTION PAPER]

(46)

ADDITIONAL SPACE FOR ANSWERS

Marks

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Total Marks

[MATH(I1)05P2A]

NATIONAL
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Time: 55 minutes

MATHEMATICS
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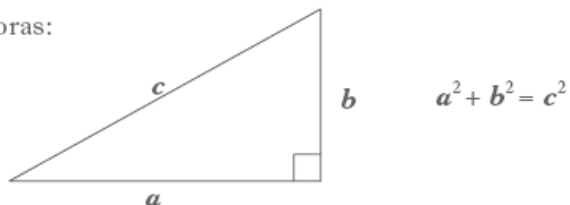
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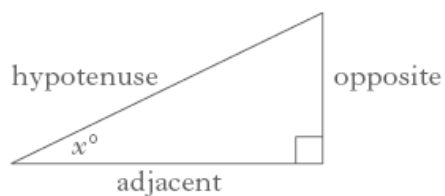
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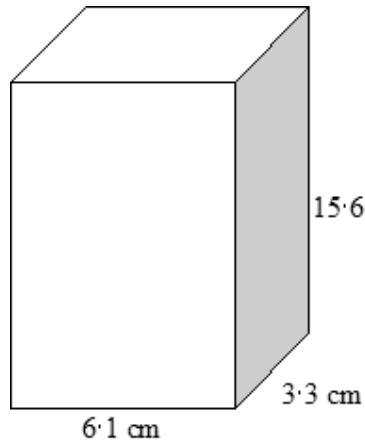
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(a) Calculate Pat's weekly wage.

(b) In addition, Pat works 4 hours overtime at **time and a half**. Calculate her overtime pay.

(2)

(3)

[Turn over (2)

Marks

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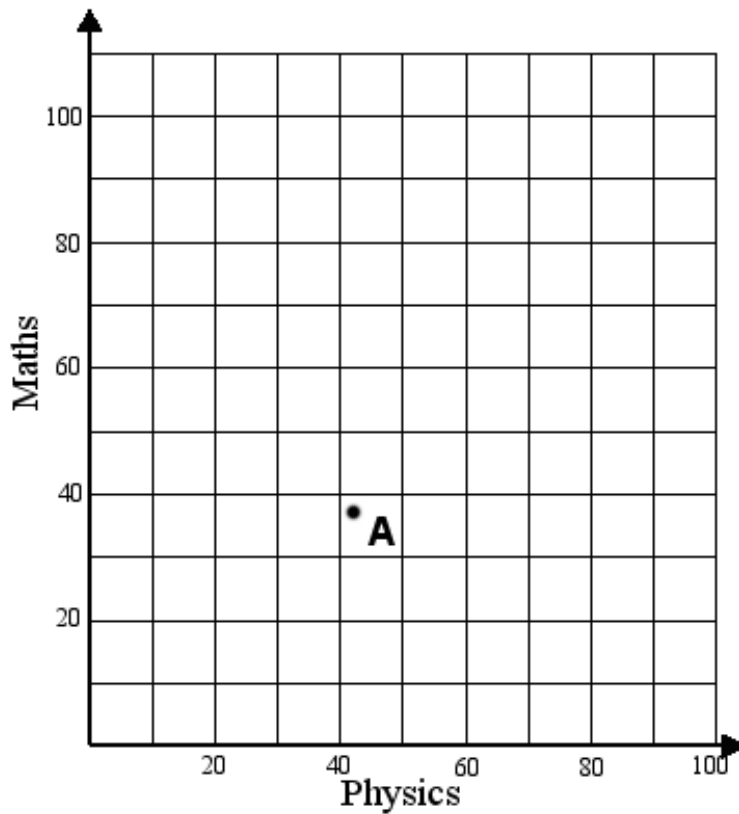
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- (a) Display these results on the scattergraph below.
Pupil A has already been entered.



(3)

- (b) Draw a line of best fit for the points on the graph.

[Turn over

(1)

Marks

5. A company gives a bonus payment to each of the employees once a year. The bonus payments are shown in the table below

<i>Bonus (£)</i>	<i>Frequency</i>	<i>Bonus * Frequency</i>
350	5	
500	3	
750	2	
1000	7	
1500	4	
3000	4	
Total		

(a) Write down the modal bonus

(b) Complete the above frequency table

(c) Find the mean bonus

(1)

(3)

(1)

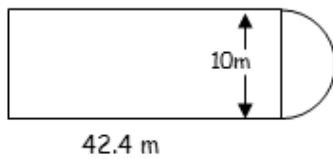
Marks

6. Pauline gets a job as a stunt double in the movies and wants to take out a life insurance policy. In this policy, she pays a monthly premium of £2.15 for every £1000 he insures herself for. She decides to insure his life for £36500.

Calculate how much Pauline will pay over the course of 15 years.

(3)

7. Mr Samson has designed a play area for children consisting of a rectangle and a semi circle as below.

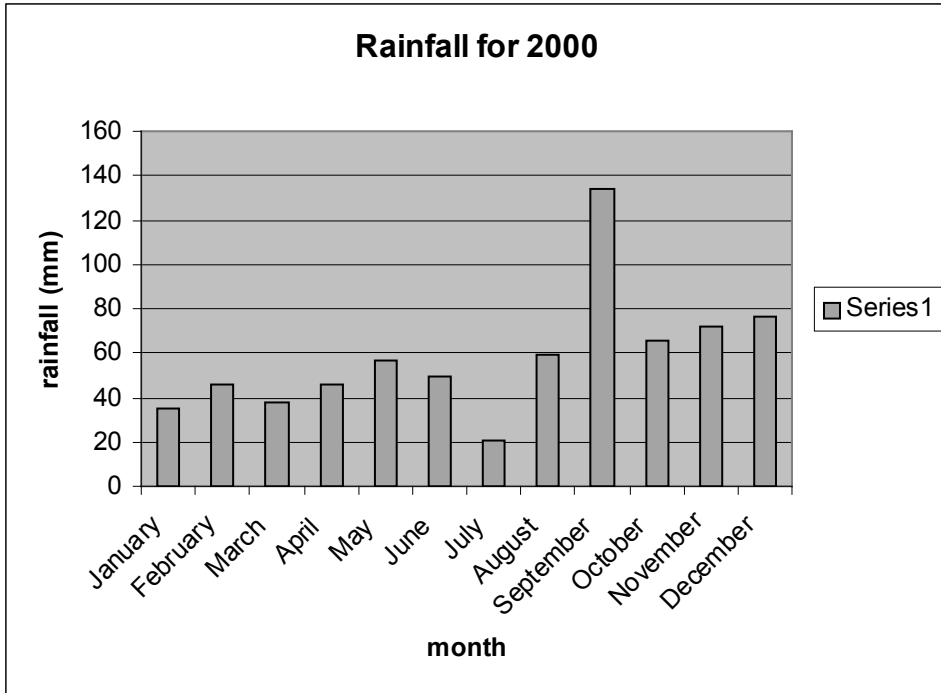


He wishes to build a fence around the play area.

Calculate how much fencing he will require.

[Turn over (4)

8. Paul recorded the monthly rainfall at his home in Perth. He recorded the results on the graph below.



- (a) How much rain fell in August?
- (b) Which two months had the same amount of rain?
- (c) Which month had the least amount of rain?

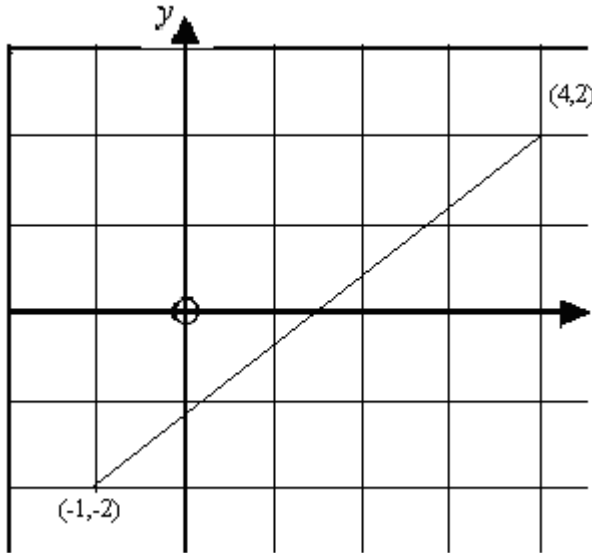
(1)

(1)

(1)

Marks

9. The diagram below shows the points $(-1,-2)$ and $(4,2)$.
Calculate the distance between the two points.
Round your answer to 2 decimal places.
Show all your working
Do not measure with a ruler.



(4)

[Turn over

Marks

10. The following data represents the temperatures taken at midday on 15 consecutive days in March.

5 6 2 11 14 13 14 8 4 10 14 7 4 8 14

Calculate the Inter-Quartile range.

(3)

Marks

11. Mr Johnson is going on holiday to Canada. He exchanges £1200 in to Canadian dollars at the exchange rate of £1 = \$2.54.

(a) Calculate how much Mr Johnson has in Canadian Dollars.

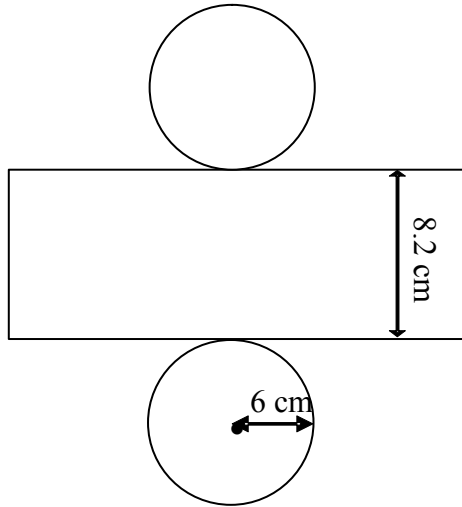
(2)

(b) On his return, Mr. Johnson discovers he has \$372 remaining. He changes this back to pounds at the rate of £1 = \$2.30. Calculate (to the nearest penny) how much Mr. Johnson has left.

(3)

[Turn over

12. Shown below is the net of a cylinder. Calculate the surface area of the shape.



Marks

(4)

(45)

ADDITIONAL SPACE FOR ANSWERS

Marks

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