SECONDARY SCHOOL ANNUAL EXAMINATIONS 2011

Directorate for Quality and Standards in Education
Educational Assessment Unit

FORM 5 **MATHEMATICS SCHEME B** **TIME: 20 minutes**

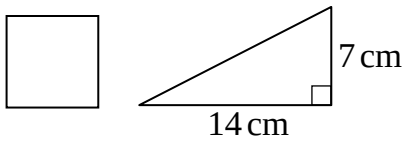
Non Calculator Paper

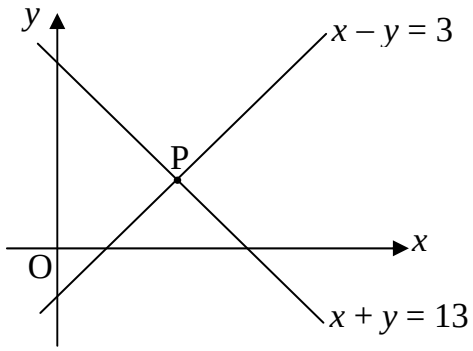
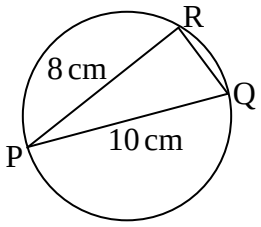
Name: _____ **Class:** _____

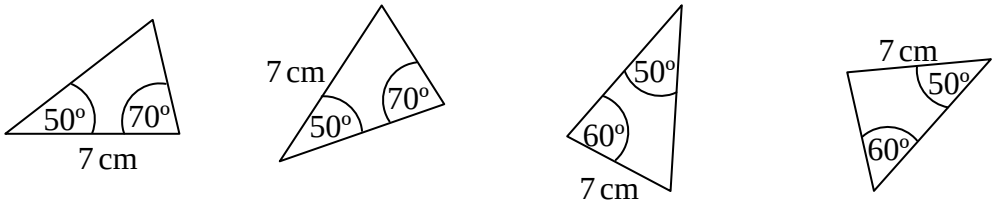
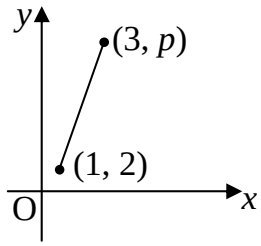
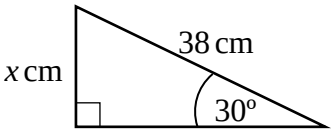
Mark

INSTRUCTIONS TO CANDIDATES

- **Answer all questions.**
- **This paper carries a total of 20 marks.**
- **Calculators and protractors are NOT allowed.**

No.	Question	Space for Working
1	Evaluate $250 + 75 \times 4$. **Answer: _____**	
2	€125 are shared between 2 people in the ratio of 4 **:** 1. What is the **larger** share? **Answer: €_____**	
3	A student scored $\frac{17}{25}$ in a Mathematics test. What was his **percentage** mark? **Answer: _____%**	
4	Given that $f(x) = 5x - 3$ and $f(x) = 32$, find the value of x. **Answer: _____**	
5	The area of the square is **equal** to the area of the triangle. What is the length of one side of the square?  **Answer: _____ cm**	
6	The turtle starts at the position shown. Make a sketch of what the turtle draws to satisfy these LOGO commands. PD FD 60 LT 90 FD 120 RT 90 FD 60	
7	Write down the value of 0.2^2. **Answer: _____**	

No.	Question	Space for Work
8	A bank pays an annual interest of 1% on a savings account. What is the interest paid in 1 year on €4000? **Answer: € _____**	
9	Write down the x coordinate of the point P.  **Answer: _____**	
10	A sequence of numbers begins: 7, 10, 13, 16, … Which **one** of the following is a member of the sequence? A) 45 B) 46 C) 47 D) 48 **Answer: _____**	
11	Evaluate $\frac{1}{2}$ of $\left(\frac{2}{3}+\frac{1}{4}\right)$. **Answer: _____**	
12	Work out $(2.3 \times 10^5) \times (4 \times 10^7)$, giving your answer in **standard form**. **Answer: _____**	
13	 The diameter PQ of the circle is 10 cm and PR is 8 cm. Write down the length of RQ. **Answer: _____ cm**	

No.	Question	Space for Work
14	The **sum** of two whole numbers is 24. The **range** of the numbers is 6. What is the **smaller** number? **Answer: _____**	
15	Write down the value of $3 \times 7.5 - 2 \times 7.5$. **Answer: _____**	
16	Which **two** of the triangles **sketched** below are congruent? Underline the correct reason for your answer.  A) B) C) D) **Answer: ____ and ____ ; Reason: SSS SAS ASA RHS**	
17	 The gradient of the line joining the points (1, 2) and (3, p) is 3. Find the value of p. **Answer: _____**	
18	 Given that $\sin 30^\circ = \frac{1}{2}$, write down the value of x. **Answer: _____**	
19	Given that $2^x = \frac{1}{16}$, write down the value of x. **Answer: _____**	
20	Write down the value of $\sqrt{3}\left(\sqrt{12} - \sqrt{3}\right)$. **Answer: _____**	

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FORM 5 **MATHEMATICS SCHEME B** **TIME: 1h 40min**

Main Paper

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	Total Main	Non Calc	**Global Mark**
Mark																

DO NOT WRITE ABOVE THIS LINE

Name _____ **Class** _____

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN.
ANSWER ALL QUESTIONS.

1. (a) In 2010 the school population was 850. In 2011 the school population decreased to 782. Work out the **percentage decrease**.

Percentage decrease = _____ %

(b) The price of a pair of shoes in a shop in December was € 80.
In January the shop reduced the price by 20%.
In February the shop reduced the **January** price by a further 20%.
Work out the price of the pair of shoes in **February**.

Price in February = € _____

_____(4 marks)

2. Solve the simultaneous equations:

$3x - y = 9$

$5x - 2y = 14$

x = _____, y = _____

(4 marks)

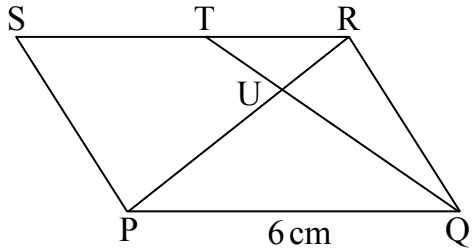
3. 

Diagram NOT to scale

PQRS is a parallelogram.

ST is **twice** as long as TR.

PQ = 6 cm.

(a) Explain why triangles TUR and QUP must be **similar**. **Give reasons.**

(b) Write down the length of TR.

TR = _____ cm

(c) Write down the ratio $\frac{TR}{QP}$ in it simplest form.

Ratio $\frac{TR}{QP}$ = _____

(d) Write down the ratio $\frac{UR}{RP}$ in it simplest form.

Ratio $\frac{UR}{RP}$ = _____

(6 marks)

Name: _____ Class: _____

4. George used a spreadsheet to keep a record of his car's annual running costs in 2010.

	A	B
1	Road Licence (€)	127.00
2	Insurance (€)	178.26
3	VRT (€)	20.27
4	Amount Spent on Petrol Annually (€)	1056.00
5	Amount Spent on Servicing Annually (€)	325.00
6	TOTAL Amount Spent Annually (€)	
7	Number of km Travelled Annually	9600.00
8	Cost of 100 km Travelled in 2010 (€)	

(a) What formula did George type in cell **B6**?

= _____

(b) What number did George obtain in cell **B6**?

_____

(c) What formula did George type in cell **B8**?

= _____

(d) What number did George obtain in cell **B8**?

_____

(4 marks)

5. The formula $C = \frac{5}{9}(F - 32)$ can be used to change temperatures from degrees Celsius (º*C*) to degrees Fahrenheit (º*F*).

(a) On a very hot day in August the temperature was given as 104º*F*.
Use the formula to work out the temperature in degrees Celsius (º*C*).

_____ ***ºC***

(b) Make *F* the subject of the formula.

F = _____

(c) The temperature at which petrol boils is given as 95º*C*.
What is this temperature in degrees Fahrenheit (º*F*)?

_____ ***ºF***

(6 marks)

6. A boat sails 16.2 km from Ġ (Ġnejna Bay), on a bearing of 305º, to a point S.
It then changes direction and sails 3.8 km towards X (Xlendi Bay).
Angle ĠSX is a right angle.

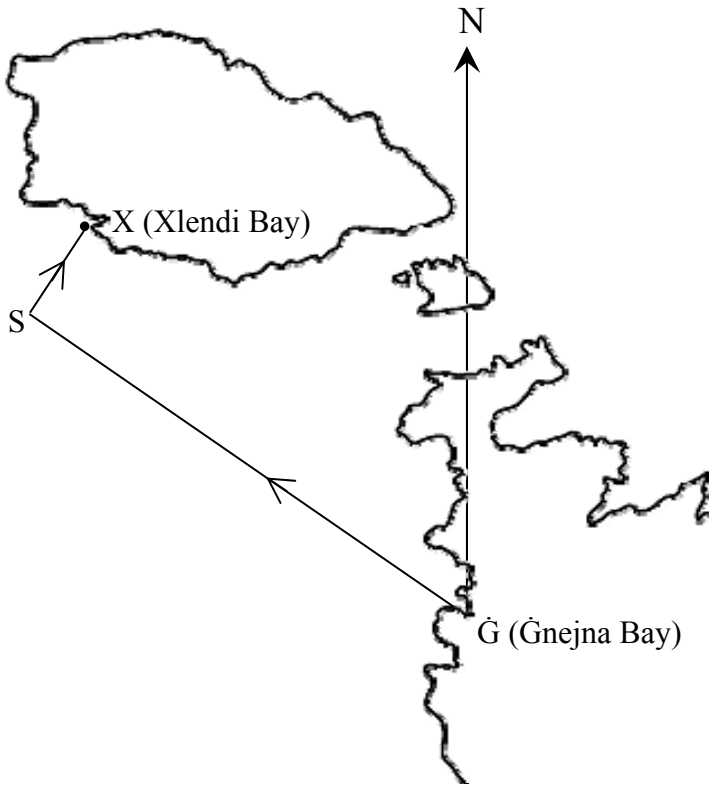


Diagram NOT to scale

Work out:

(a) The distance ĠX, correct to **1 decimal place**.

ĠX = _____ km

(b) The bearing of X from Ġ, correct to **the nearest degree**.

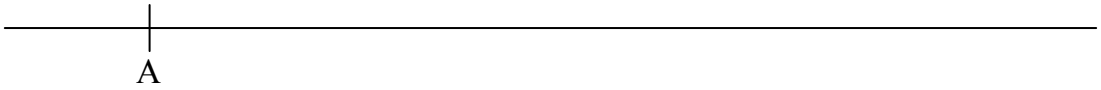
Bearing of X from Ġ = _____ º

_____(5 marks)

Name: _____ Class: _____

7. **Use ruler and compasses only to answer this question.**
All construction lines and arcs must be clearly shown.

(a) Construct triangle ABC in which AB = 10 cm, ∠BAC = 30º and ∠ABC = 60º.



(b) Construct the perpendicular bisector of AB.

(c) Construct a circle to pass through points A, B and C.

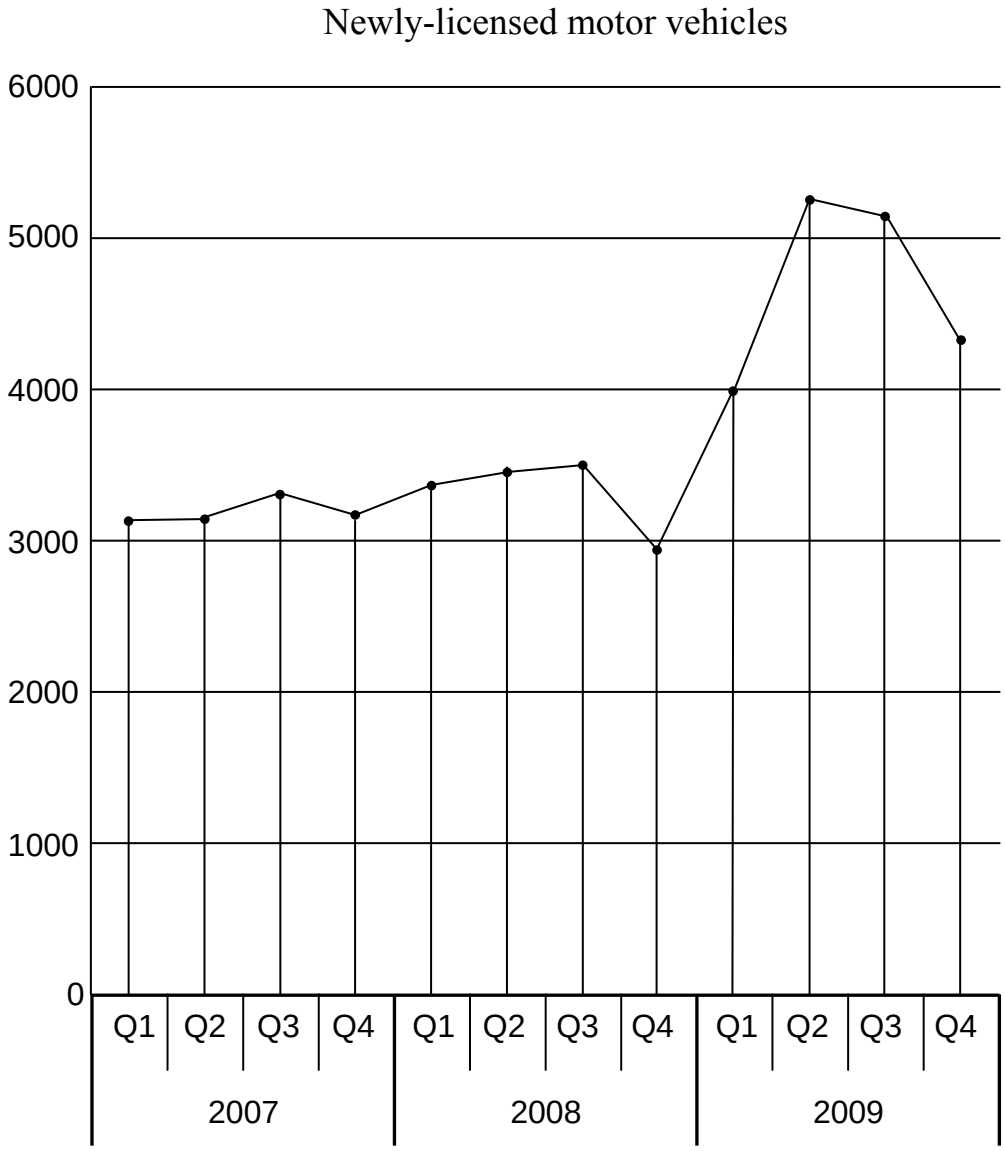
(d) What is the radius of the circle?

Radius = _____ cm

_____(8 marks)

8. The graph shows the number of new licences for motor vehicles issued each q
(3 month period) for the years 2007, 2008 and 2009.

For each year the quarters are shown as Q1 (1st quarter), Q2 (2nd quarter) and so on.



(*The above graph is adapted from information given by the National Statistics Office - Malta*)

(a) Write down the **quarter** and **year** during which the **smallest** number of new licences was issued.

Quarter: _____, Year: _____

(b) Which **quarter** and **year** had the **largest drop** in the issue of new licences?

Quarter: _____, Year: _____

(c) Which **quarter** and **year** had the **largest increase** in the issue of new licen

Quarter: _____, Year: _____

(d) Give an **estimate** for the number of new licences issued for Q3, 2008.

New licences issued for Q3, 2008 _____

(e) Underline the correct answer.
The number of new licences for Q2, 2009 was

A. Half B. One and a half times C. Twice D. Two thirds

the number of new licences for Q3, 2008.

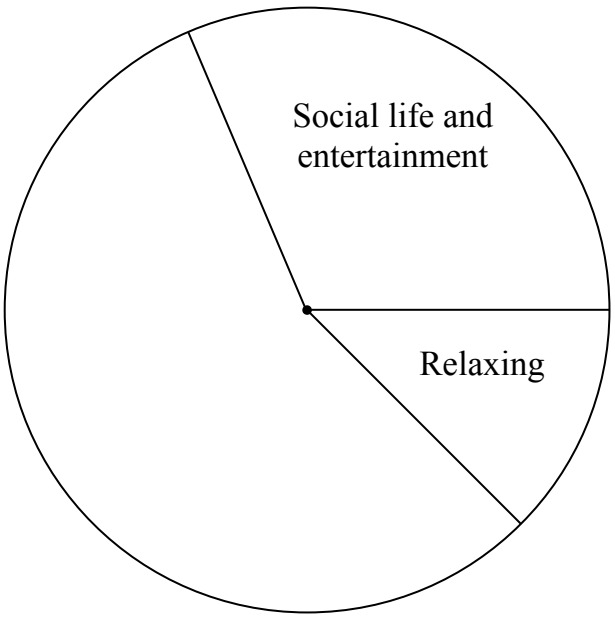
_____ _____(5 marks)

9. (a) The table gives information on the average time spent on free time activities during the weekend by single persons.

Complete the pie chart to represent the information.

Free time activities	%age	Angle
Social life and entertainment	31.5%	113º
Sports and outdoor activities	12.7%	
Hobbies and games	9.7%	
Mass media	33.6%	
Relaxing	12.5%	45º
Total	100.0%	360º

(*You are advised to round off to whole numbers when working out angles*).



The information in the above table is taken from the Time-Use Survey - National Statistics Office - Malta

9. (b) The table shows the number of students in each of 34 minibuses arriving at one morning.

Number of students in a minibus	6	7	8	9	12	13	14	15
Number of minibuses	2	1	*n*	3	6	6	7	5

(i) Write down the value of *n*.

n **=** _____

(ii) Find the **median** number of students per minibus.

_____

(iii) Work out the **mean** number of students per minibus, correct to **1 decimal place**.

Mean = _____

(iv) What is the **modal** number of students per minibus?

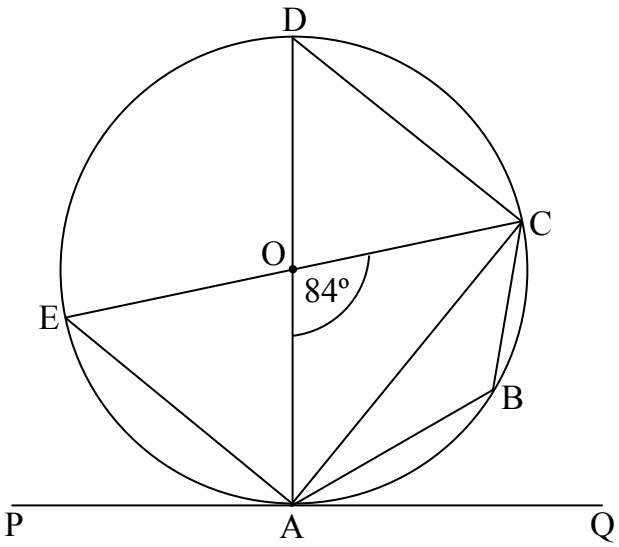
Modal Number = _____

_____(9 marks)

10. A, B, C, D and E are five points on the circumference of a circle centre O.

PAQ is a tangent to the circle at A.

Angle AOC = 84º



(a) Write down a reason why:

(i) ∠DAQ is a right angle. _____

(ii) ∠DCA is a right angle. _____

10. (b) Work out the size of the following angles.
Show all your working and give reasons for your answers.

(i) ∠AEC

(ii) ∠ABC

(iii) ∠DAC

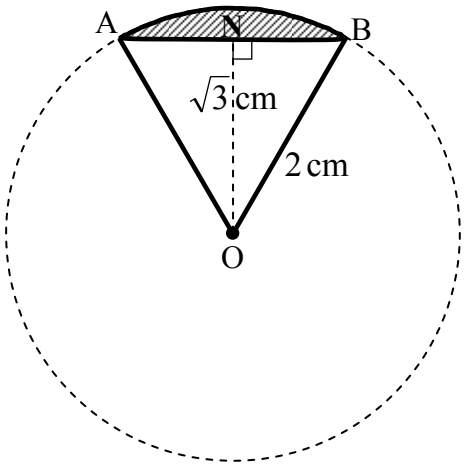
(iv) ∠CAQ

(8 marks)

11. AOB is an **equilateral** triangle of side 2 cm.
The vertex O is at the centre of the circle.
A and B are on the circumference of the circle.

ON = $\sqrt{3}$ cm.

Work out, correct to **3 significant figures**:



(a) The area of the sector AOB.

Area of Sector AOB = _____ cm^2

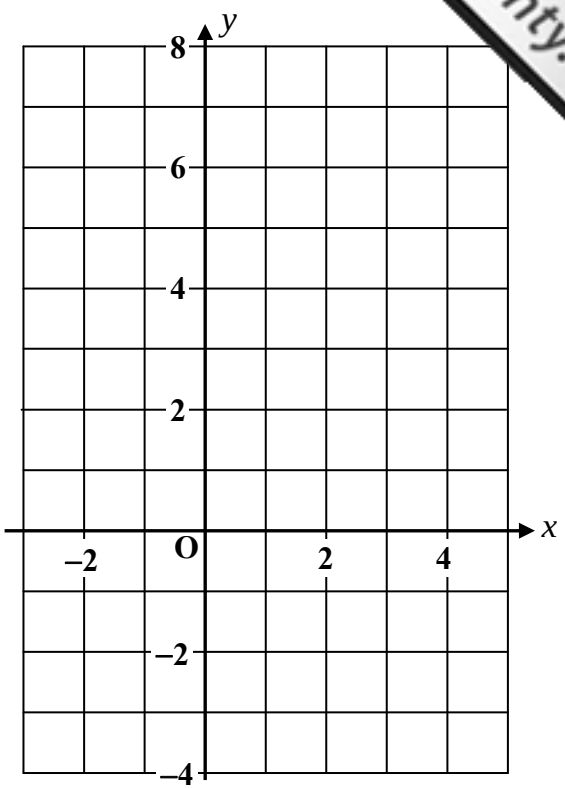
(b) The area of the shaded segment.

Area of Shaded Segment = _____ cm^2

(5 marks)

12. (a) Complete the table for $y = 5 - 2x$.

x	-1	0	4
$y = 5 - 2x$		5	



(b) Use the x and y values in the table to draw the straight line graph of $y = 5 - 2x$ for values of x between -1 and 4.
Label the line **A**.

(c) Write down the **gradient** of line **A**.

Gradient of line A _____

(d) Another line, **B**, passes through the **origin** and is **parallel** to line **A**.

(i) Write down the **equation** of line **B**.

Equation of line B _____

(ii) Use the same scales and axes and draw line **B**.

_____(8 marks)

13. (a) Shape **B** is the reflection of shape **A**. Draw the mirror line. Label the line

(b) Rotate shape **B** 180º about (0, 0). Label the image **C**.

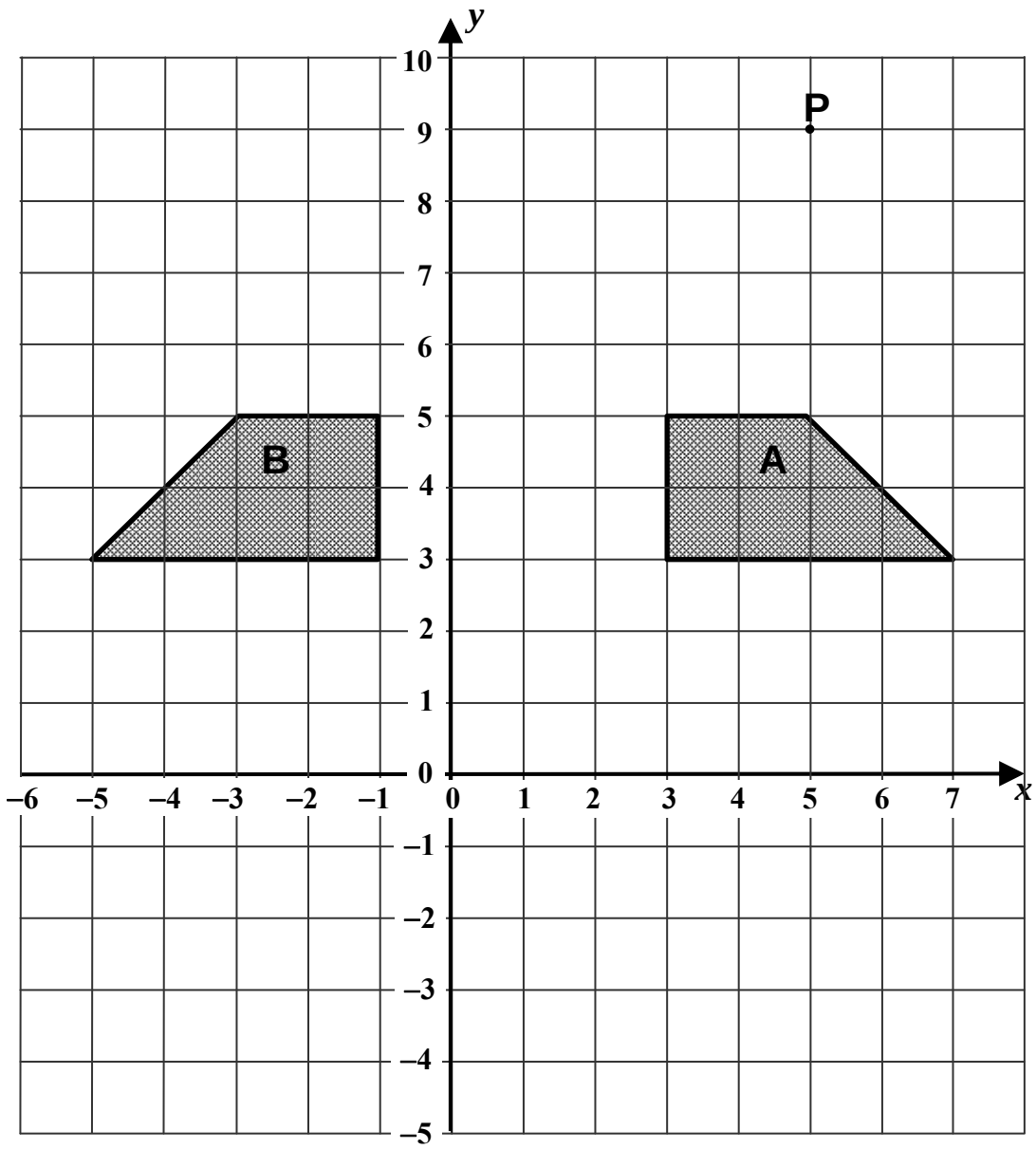
(c) Reflect shape **C** in the line $y = -1$. Label the image **D**.

(d) Describe **fully** the single transformation that maps shape **A** onto shape **D**.

_____

(e) Enlarge shape **A** by a scale factor of $\frac{1}{2}$ and centre of enlargement **P**.

Label the image **E**.



_____ (8 marks)

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