AMERICAN ACADEMY LARNACA

PLACEMENT EXAM

YEAR 2

SAMPLE 1

DURATION: 2 hours

NAME: .....

Instructions to candidates

Full marks may be obtained for answers to **ALL** questions.

Answer **ALL** questions in the spaces provided in this paper.

Show all stages in any calculations.

Calculators can **NOT** be used.

This paper has **30** questions.

The total for this paper is 141 marks.

QUESTION 1

Round the following numbers to the degree of accuracy indicated in the brackets:

(a) 93.49 (nearest unit) .....

(b) 6.6253 (2 decimal places) .....

(c) 0.0007254 (3 significant figures) .....

(d) 2567 (2 significant figures) .....

(2)

QUESTION 2

(a) Three girls earned a total of £36

They shared the £36 in the ratio 7:2:3

Donna received the largest amount.

Work out the amount Donna received.

£.....

(1)

(b)

Rachel, Mario and Sanjit share some money in the ratios 4 : 3 : 9
Mario receives £96
Work out the difference between the amount received by Rachel and the amount received by Sanjit.

£.....

(2)

QUESTION 3

Work out an estimate for:

$$\frac{3970}{246 \times 4.86}$$

.....

(2)

QUESTION 4

(a) *Increase* €400 by 15%.

.....

(1)

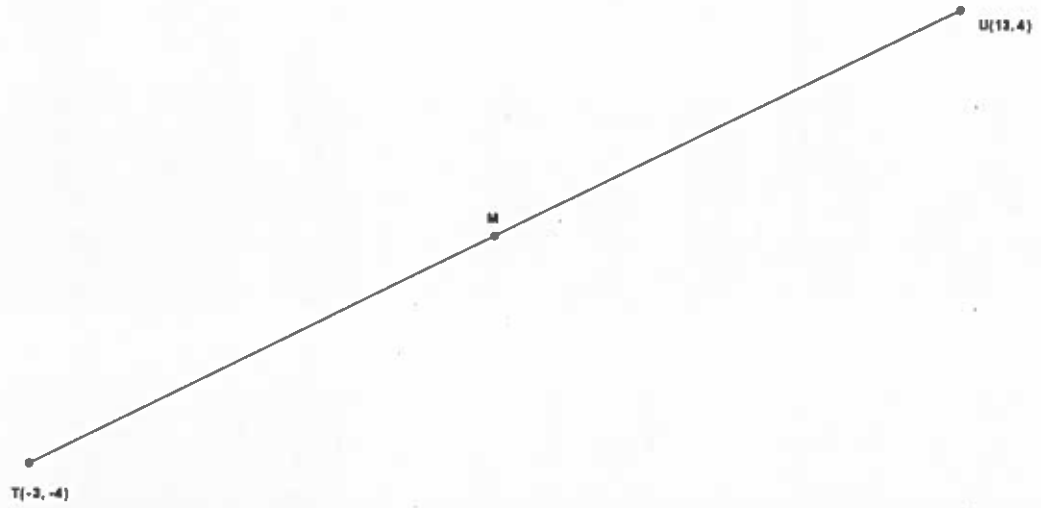
(b) In a sale, normal prices are reduced (decreased) by 20%. The normal price of a camera is £80. Work out the sale price of the camera.

£.....

(2)

QUESTION 5

Find the coordinates of the mid point M of the following line segments:

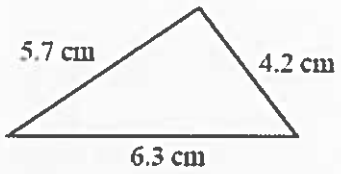


M (..... , ...)

(1)

QUESTION 6

Here is a sketch of a triangle.

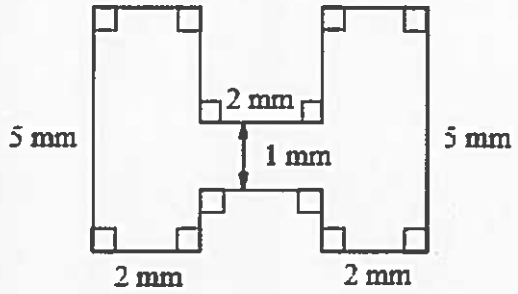


In the space below, use ruler and compasses to **construct** this triangle accurately. You must show all construction lines.

(3)

QUESTION 7

Find the perimeter and the area of the following compound shape.



For the perimeter give your answer in **cm** and for the area give your answer in **cm^2**

Show all your workings.

Perimeter =..... cm

Area = ... cm^2

(4)

QUESTION 8

(a) Write the following ordinary number in standard form

0.0000308 =

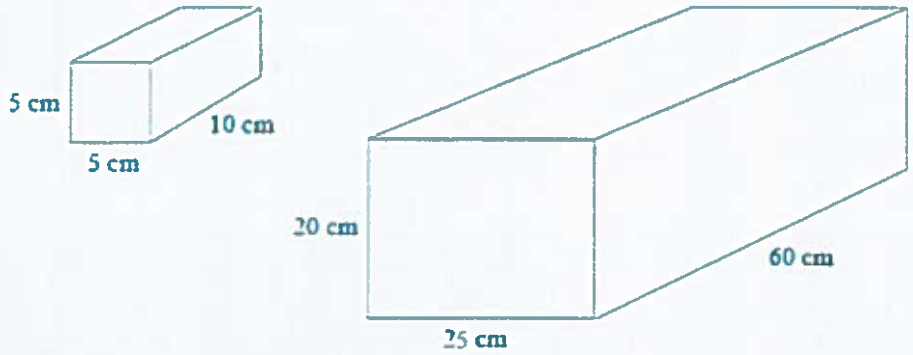
(b) Convert the following number from standard form to ordinary number.

$6.87 \times 10^5 =$

(2)

QUESTION 9

The diagram shows a large box and a small box. both of which are cuboids.



(a) Calculate the volume of the large box.

..... cm^3

(b) Calculate the volume of the small box.

..... cm^3

(c) Find how many small boxes will fit into the large box?

.....

(4)

QUESTION 10

Simplify fully the following algebraic expressions:

(a) (a) $-15y - 9 + 6y - 5$ =

.....

(b) $3e - 5r + 6 - 2t - 4 - 8g - 11e - 4r + 7t =$

.....

(4)

QUESTION 11

When you choose one letter at random from the word MULTICULTURAL

Find the probability that

(a) it is a U

.....

(b) it is a vowel

.....

(c) it is not a T or a R

.....

(d) it is a D

.....

(4)

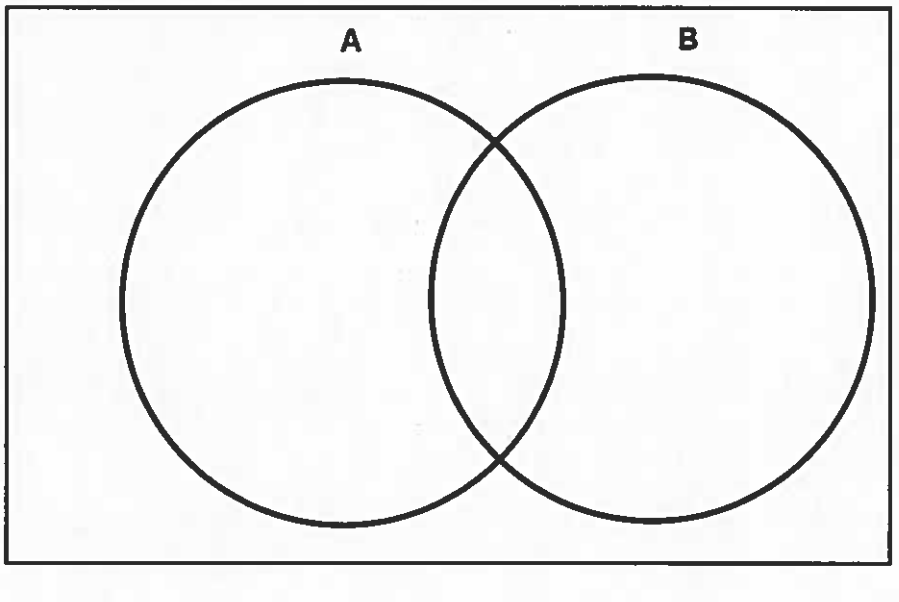
QUESTION 12

U = {whole numbers from 1 to 25 inclusive }

A = {even numbers}

B = {multiples of 3}

(a) Complete the Venn diagram below



(4)

(*b*) List the members of set *B*.

.....

(1)

(*c*) Write down the set $A \cup B$

.....

(1)

(*d*) Write down the set $A \cap B$

.....

(1)

(e) Write down the set A'

.....

(1)

(f) Write down the set $(A \cup B)'$

.....

(1)

(g) Write down the number of the members that are not in the set *A* or *B*.

.....

(1)

QUESTION 13

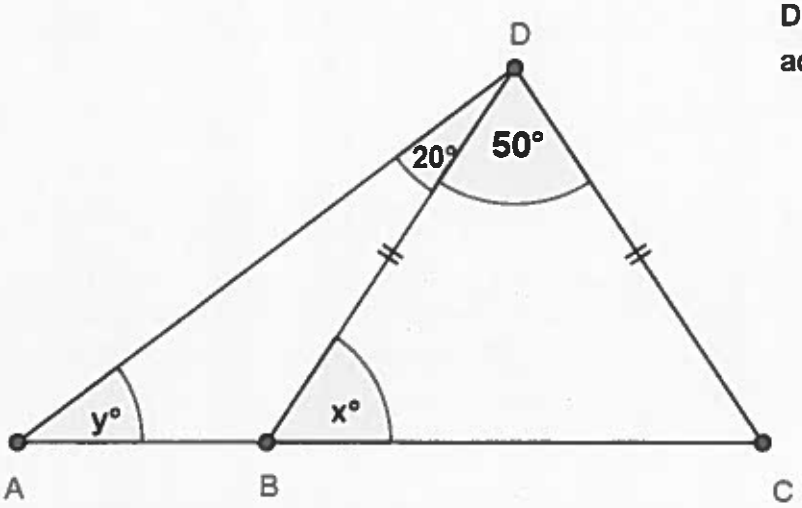


Diagram NOT accurately drawn

ABC is a straight line.
BD = *CD*.
Angle *BDC* = 50°.
Angle *ADB* = 20°.

(a) Work out the size of the angle marked x°.

x° = ...

Give reasons for your answer.

.....

.....

..... (2)

(b) Work out the size of the angle marked y°.

y° = ...

Give reasons for your answer.

.....

.....

.....

(2)

QUESTION 14

Complete the following table.

Fraction	$\frac{4}{5}$			
Decimal		0.004		
Percentage			74%	$15\frac{5}{8}\%$

(4)

QUESTION 15

(a) In an aeroplane the total number of passengers travelling is 340: men, women and children. Men are 20 less than the women and the number of children is double the number of the women.

Form a mathematical equation and solve it to find the number of men, women and children in the aeroplane.

Number of men= .....

Number of women= .....

Number of children = ...

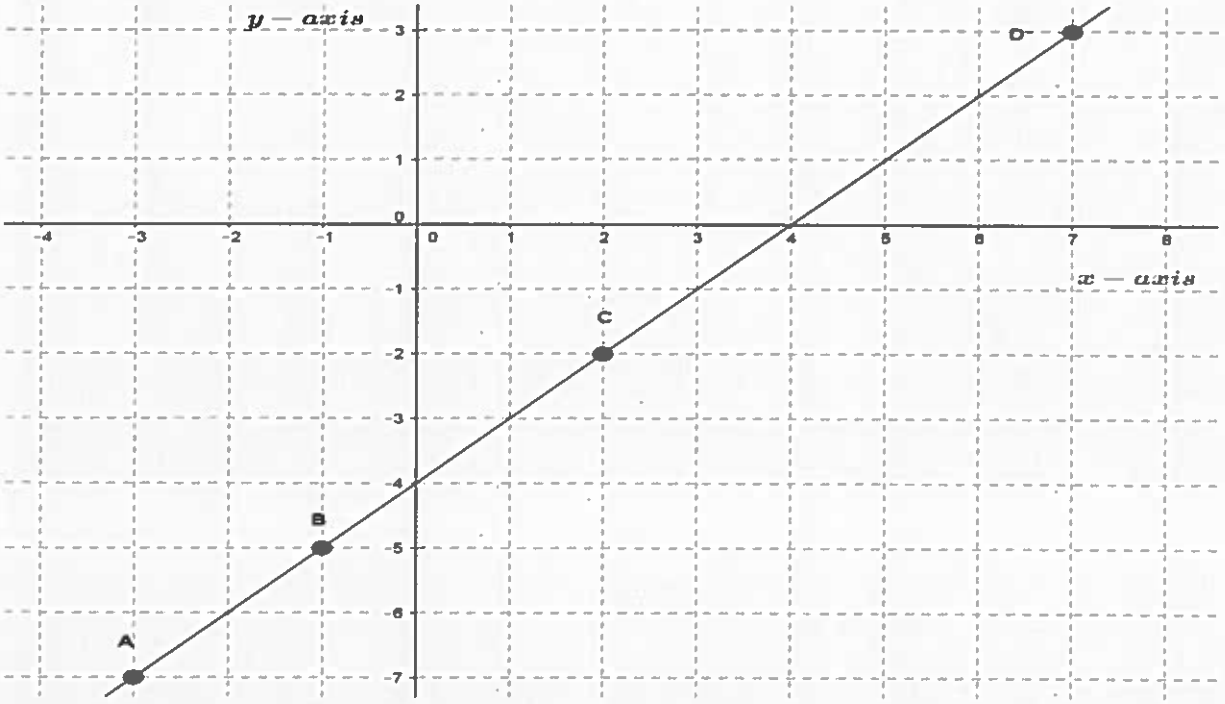
(4)

(b) 50 take away 113. Then divide the result by 3.What do you get?

Show all your workings.

..... (2)

QUESTION 16



The points A, B, C and D are all on the same straight line.

(a) Write down the coordinates of A, B, C and D

A (..... , ...) , B (..... , ...) ,
C (..... , ...), D (..... , ...)

(4)

(b) Write a formula for y in terms of x.

..... (1)

(c) E , F,G and H are also points on this line.
Write down the missing coordinates.

$E(-23,.....)$, $H(.....,b-4)$

(2)

QUESTION 17

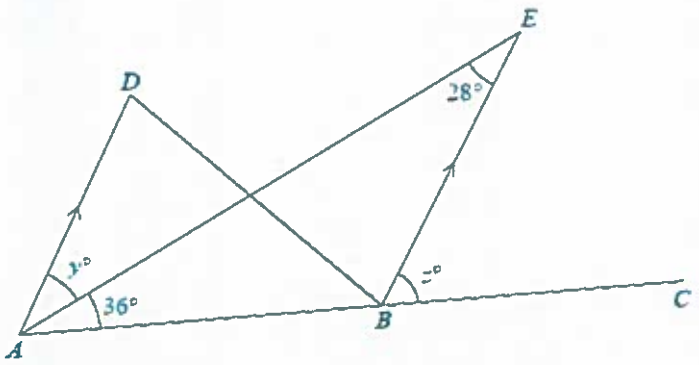


Diagram NOT accurately drawn

ADB and *AEB* are triangles.
ABC is a straight line.
AD is parallel to *BE*.

(a) Find the value of y.

$y° =$ .....

Give reason for your answer.

.....

.....

(2)

(b) Find the value of z.

$z° =$ .....

Give reason for your answer.

.....

.....

(2)

QUESTION 18

Calculate the following giving your answers in the *simplest form*.

(a) $\frac{16}{9} \times \frac{12}{44} =$

.....

(b) $-\frac{1}{2} + \frac{3}{5} \div \left(-11 + 2\frac{3}{5}\right) =$

.....

(5)

QUESTION 19

Express each quantity in terms of the unit given in the brackets.

(a) 123 mm^3 $(m^3) =$ .....m^3

(b) 5654 m^3 $(litres) =$ .....litres

(c) 12600 kg (tonnes) = ... tonnes

(d) 18.678 m^2 $(cm^2) =$ .....cm^2

(e) 23.06 litres and 840 ml (centilitres=cl) = ...cl

(5)

QUESTION 20

In a very small village there are 114 men, 60 women and 48 children.

We want to make teams such that each team has the same number of men, women and children.

(a) Find the highest possible number of teams that we can make.

..... (3)

(b) Find how many men, how many women and how many children each team will have.

Number of men= .....

Number of women= .....

Number of children = ...

(3)

QUESTION 21

This table shows the number of goals a basketball team has scored.

Number of goals	Number of games	
0	6	
1	10	
2	9	
3	5	
4	2	

Find the following, showing all your calculations:

a) Mean

.....

b) Mode

.....

c) Median

.....

d) Range

.....

(6)

QUESTION 22

Solve the following equations, giving exact answers in their simplest form. Show clearly all your steps.

a) $2 - 20y = 47 - 2y$

$y =$ .....

b) $\frac{3}{8}a - 4 = -\frac{5}{12}$

$a =$ .....

(4)

QUESTION 23
PART A:

Find a formula for q in terms of p

p	1	2	3	4
q	8	11	14	17

$q =$..... (2)

PART B:

Below you are given a formula. By substituting the numbers given into the appropriate letters, find the value of the letter required.

$$r = \frac{2}{7}p - (q - t) + 20s$$

Find r when $p = 7,\ q = 4,\ s = -\frac{1}{10},\ t = -3$

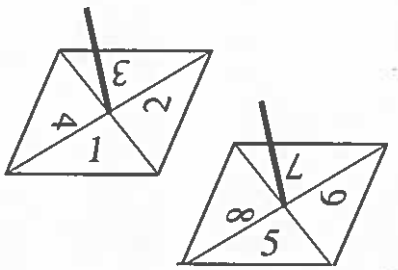
$r =$..... (3)

QUESTION 24

Zen has two fair spinners.

One of the spinners is numbered 1, 2, 3, 4.
The other spinner is numbered 5, 6, 7, 8.

Zen is going to spin the two spinners.
He multiplies the numbers on the two spinners to get the score.



(a) Complete the table to show all the possible scores.

×	1	2	3	4
5	5	10	15	20
6	6			24
7	7			28
8	8	16	24	32

(2)

(b) What is the probability of getting a score of exactly 28?

..... (1)

(c) What is the probability of getting a score that is a square number?

..... (1)

(d) Work out the probability of getting a score of more than or equal to 24.

..... (1)

(e) Work out the probability of getting a score that is not a prime factor of 70.

..... (1)

QUESTION 25

Work out the following:

(a) $8^2+2^3-14+(-6)=$

.....(2)

(b) $-12-(-3)=$

.....(1)

(c) $\left(-\frac{1}{2}\right)\times(-62)-30\div(-6)=$

.....(2)

(d) $(-16)\div(-4)\div(-2)=$

.....(2)

(e) $9+(-4\times5-3-54\div6)$

.....(2)

QUESTION 26

Find the exact value of the following:

(a) $(-3)^0 =$ .....

(b) $\left(\frac{2}{3}\right)^3 =$ .....

(c) $5^{-2} =$ .....

(d) $\left(-\frac{4}{5}\right)^{-3} =$ .....

(4)

QUESTION 27

Write each of the following in single index form.

(a) $2y^4 \times 6y^{-8} =$ .....

(b) $4^{-5} \times 4^{-4} =$ .....

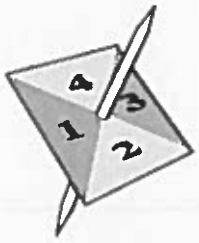
(c) $-28a^6 \div 4a^{-3} =$ .....

(d) $\frac{3b^{-11} \times 7b^{-8}}{35b} =$ .....

(4)

QUESTION 28

Here is a 4-sided spinner.



The sides are labelled 1, 2, 3, 4.
The spinner is biased.

The probability that the spinner will land on 3 is twice the probability that the spinner will land on 4.

Number	1	2	3	4
Probability	0.3	0.4		

Sabia spins the spinner once.

(a) Complete the above table.

(3)

(b)

(i) Write down the number that the spinner is most likely to land on.

..... (1)

(ii) Work out the probability that the spinner will land on an odd number.

..... (1)

Nick spins the spinner 100 times.

(c) Work out an estimate for the number of times the spinner will land on the number 2.

..... (1)

QUESTION 29

ABC line is parallel to ED.
EB line is parallel to DC.
HABC and GAEF are straight lines.

Angle GAH = 39° and angle EBC = 124° .

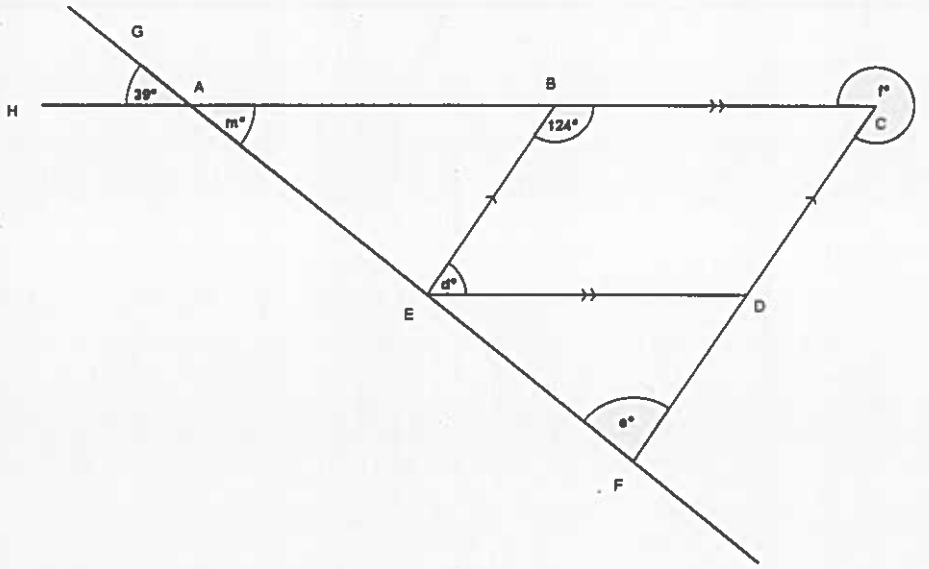


Diagram NOT accurately drawn

(i) Calculate angle $\hat{m}$

$\hat{m}$ = ... °

Give reason for your answer:

.....

.....

(2)

(ii) Calculate angle $\hat{d}$

$\hat{d}$ = ... °

Give reason for your answer:

.....

.....

(2)

(iii) Calculate angle $\hat{f}$

$\hat{f}$ = ... °

Give reasons for your answer:

.....

.....

.....

(2)

(iv) Calculate angle $\hat{e}$.

$\hat{e}$ = ... °

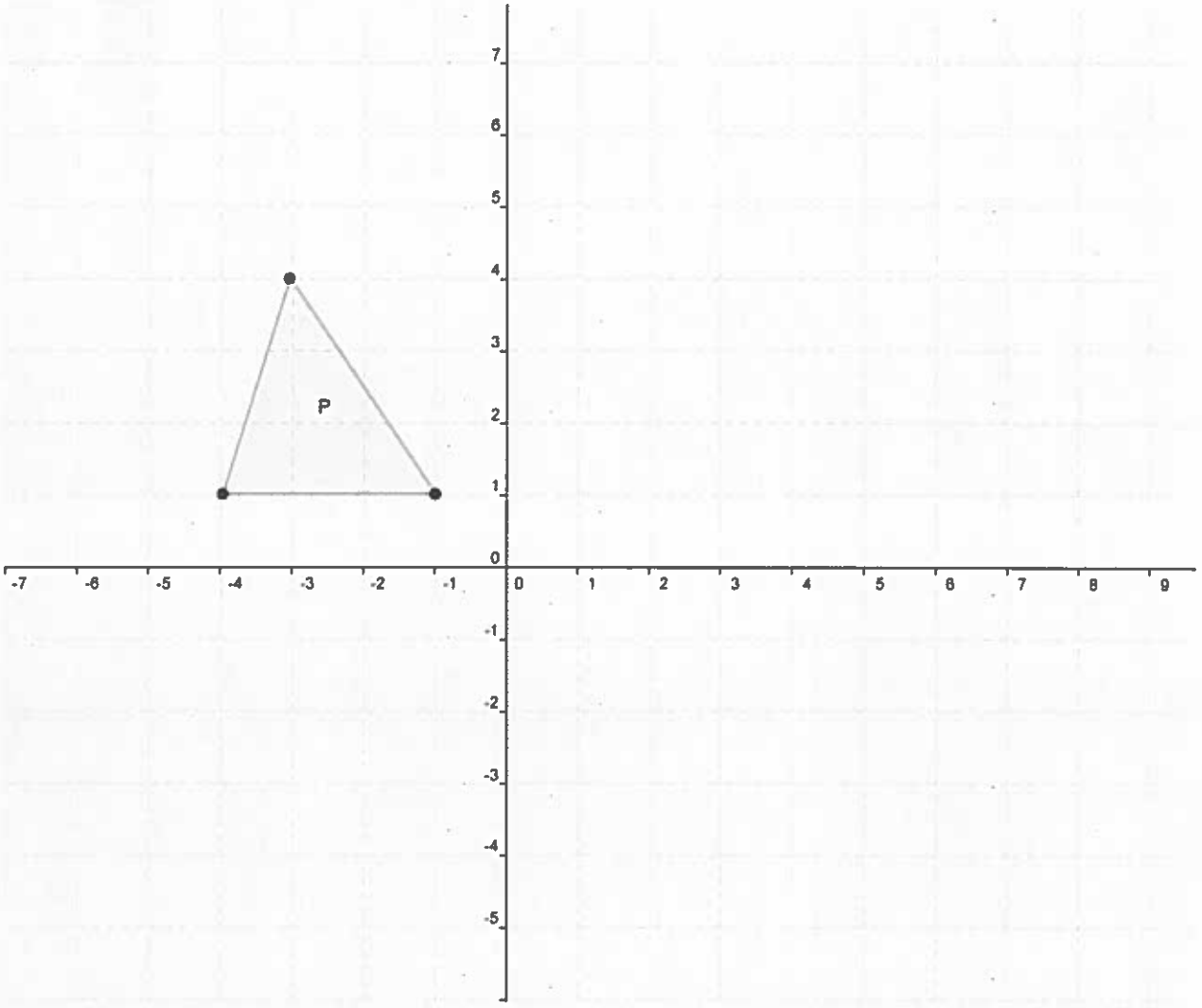
Give reason for your answer:

.....

.....

(2)

QUESTION 29



(a) Reflect shape P in the line $y = x$. Label the image Q.

(b) Rotate shape P about the point (2, 1), 90° clockwise. Label the image R.

(6 marks)