



Preca College Korçë
Mathematics Entrance Exam
30th June 2014
Time: 8:00 - 10:00

Name: _____

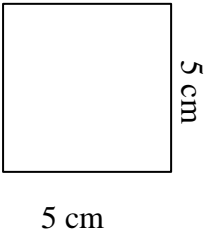
Index number: _____

Section A

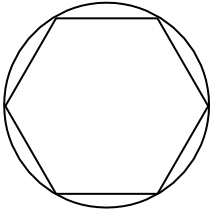
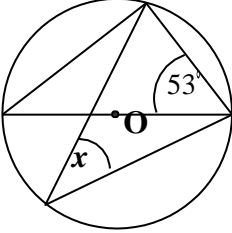
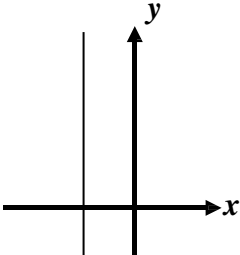
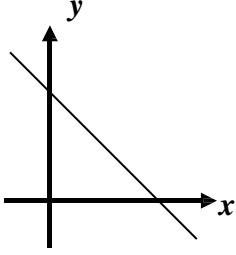
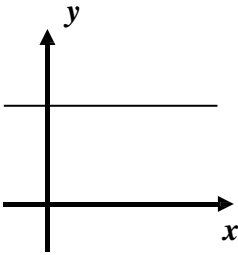
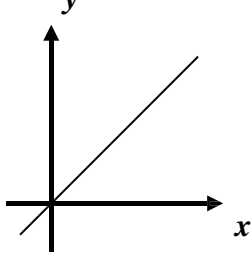
INSTRUCTIONS TO CANDIDATES

There is no need to show the working or to use the calculator.

There are 20 questions to answer. Each question carries 1 mark.

No.	Question	Space for Working
1	Write down the value of $1 - \left(\frac{1}{4} \times 3\right)$. Answer: _____	
2	What is 30% of €2? Answer: _____ cents	
3	Write 3^{-2} as a fraction. Answer: _____	
4	Write down the Least Common Multiple of 9 and 12 . Answer: _____	
5	$24 = 2^p \times 3^q$. What is the value of $(p + q)$? Answer: _____	
6	$25^2 = 625$. Write down the value of $\sqrt{6.25}$ Answer: _____	
7	The best estimate for the diagonal of the square is: A. 5 cm C. 7 cm B. 6 cm D. 8 cm  Answer: _____ cm	
8	The reciprocal of 2 is $\frac{1}{2}$ and the reciprocal of 4 is $\frac{1}{4}$ Write the reciprocal of 10 as a decimal . Answer: _____	

No.	Question	Space for Working
9	Work out the gradient of a line passing through the points A(-3, 4) and B(2, -6). Answer: _____	
10	Taking $\pi \approx 3$, find an approximation for the area of a circle having a radius of 2 cm. Answer: _____ cm ²	
11	A number P is increased by 10%. The result is Q . Q is then decreased by 10%. The result is R . Which statement is correct? A. $P = R$ B. $P > R$ C. $P < R$ Answer: _____	
12	$x = 1.5 \times 10^2$. Write the value of $2x$ in standard form . Answer: _____	
13	Given that 1 gallon \approx 4.55 litres , change 10 gallons to litres. Answer: _____ litres	
14	Mary bought 12 files at €1.50 each and 12 pens at 50 cents each. How much did she spend altogether ? Answer: € _____	
15	Work out the size of each exterior angle of a regular hexagon . Answer: _____	
16	Write an equation in x (other than $x = 3$) whose solution is 3. Answer: _____	

No.	Question	Space for Working
17	<p>The diameter of the circle is 10 cm. What is the perimeter of the regular hexagon?</p>  <p style="text-align: right;">Answer: _____ cm</p>	
18	<p>O is the centre of the circle. Find the value of x.</p>  <p style="text-align: right;">Answer: _____</p>	
19	<p>A bag contains 5 blue discs and a number of red discs. The probability of choosing a blue disc is $\frac{1}{4}$ What is the total number of discs in the bag?</p> <p style="text-align: right;">Answer: _____</p>	
20	<p>Which one of the following shows the graph of $y = 5 - x$?</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <p>A.</p>  </div> <div style="width: 50%;"> <p>B.</p>  </div> <div style="width: 50%;"> <p>C.</p>  </div> <div style="width: 50%;"> <p>D.</p>  </div> </div> <p style="text-align: right;">Answer: _____</p>	

Section B

Calculators are allowed but *the necessary working must be shown*.
Answer all questions.

1. (i) Round each number correct to **1 significant figure** to find an estimate of **P**.

$$P = \sqrt{\frac{47.8 \times 4.2}{1.9}}$$

Estimate = _____

- (ii) Use your calculator to work out the value for **P** correct to **1 decimal place**.

P = _____

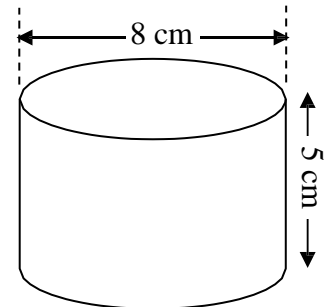
- (iii) Write down the **difference** between the answer in (i) and the answer in (ii).

difference = _____

(3 marks)

2. The formula for finding the volume of a cylinder is $V = \pi r^2 h$.

- (i) Work out the **volume of the cylinder** shown. Give your answer correct to **1 decimal place**.



Volume = _____ cm³

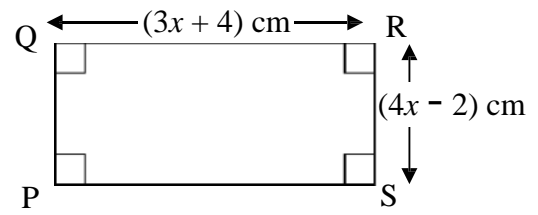
- (ii) Make r the **subject of the formula**.

r = _____

(4 marks)

3. PQRS is a rectangle.

- (i) Write, **in terms of x** , an expression for the **perimeter** of the rectangle.



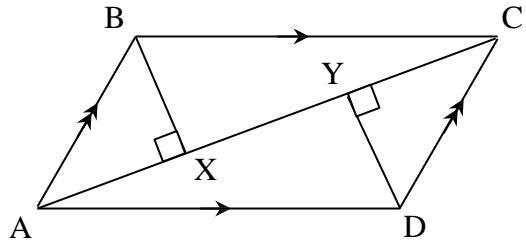
Perimeter = _____ cm

- (ii) The perimeter of the rectangle is 32 cm. Find the value of x .

x = _____

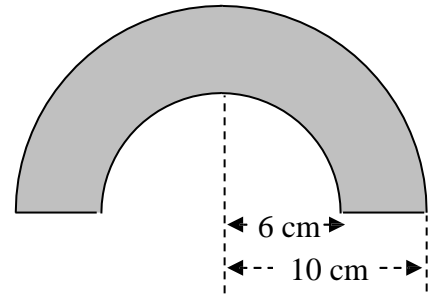
(4 marks)

4. (a) ABCD is a **parallelogram**. BX and DY are drawn perpendicular to AC. Prove that triangles ABX and CDY are **congruent**.



(5 marks)

5. The figure shows two **semi-circular** arcs. The radii of the two arcs are 6 cm and 10 cm.
 Work out the **area** of the **shaded region**.
 (Give your answer correct to **3 significant figures**.)



Shaded area = _____ cm²

(5 marks)

6. Joe is using a spreadsheet to help him work out how much he spends at the stationer's. TVSH is charged at 18%.

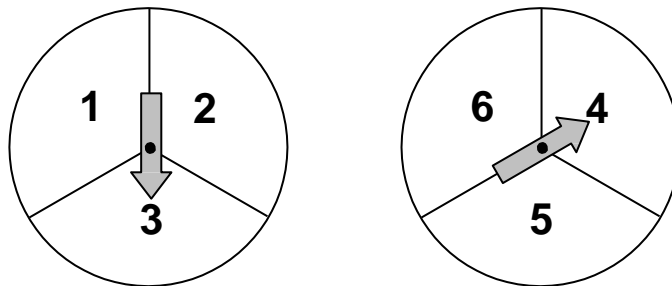
	A	B	C	D	
1	Item	Price (€)	Quantity	Total (€)	
2	File	0.90	3	2.70	
3	Copybook	0.24	5		
4	Total all items (excluding TVSH)				
5	TVSH (18%)				
6	Total all items (including TVSH)				

- (i) What **formula** did Joe type in cell **D2**? _____
- (ii) What **amount** did Joe obtain in cells **D3**, **D4**, **D5** and **D6**? (Give answers correct to the **nearest cent**.)

D3 = _____, **D4** = _____, **D5** = _____, **D6** = _____

(5 marks)

7. Alan has two spinners. The score is the **difference** between the **larger** and the **smaller number**. For example, if 3 comes up on the first spinner and 4 comes up on the second spinner, the score will be $4 - 3 = 1$.



- (i) Complete the **possibility space** to show all possible outcomes.

		First Spinner		
		1	2	3
Second Spinner	4	3	2	
	5			2
	6			

- (ii) Use the possibility space to find the probability that:
- the score is 1
 - the score is an odd number
 - the score is 3 or more.
- (Give your answers as a **fraction**.)

Answer: (a) _____ (b) _____ (c) _____

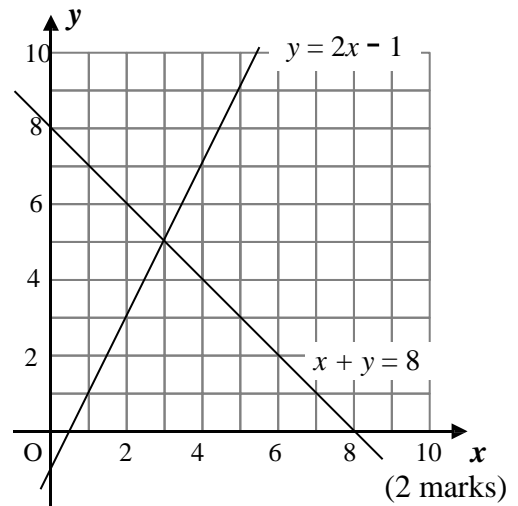
(7 marks)

8. (a) **Solve the equations**
- $$\begin{aligned} 3x - y &= 2 \\ x + 7y &= 19 \end{aligned}$$

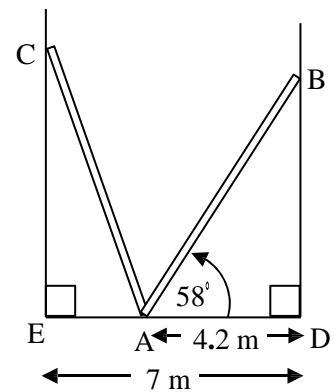
$x =$ _____, $y =$ _____

(4 marks)

8. (b) Explain how you can **use the graph** to solve the equations $y = 2x - 1$ and $x + y = 8$.



9. The diagram shows two ladders, AB and AC, resting on horizontal ground DAE in a narrow street that is 7 metres wide. AD = 4.2 metres and $\angle BAD = 58^\circ$.



- (i) Work out the **length of AB**, correct to **2 decimal places**.

AB = _____ metres

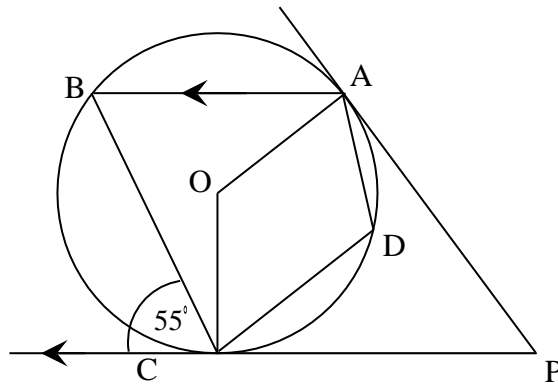
The lengths of the two ladders are **equal**.

- (ii) Work out the height of C above the ground, correct to **2 decimal places**.

CE = _____ metres

(6 marks)

10. ABCD is a cyclic quadrilateral to the circle with centre O. AP and CP are tangents to the circle.



Write down the size of the following angles, **giving reasons for your answers.**

$\angle ABC =$ _____ reason: _____

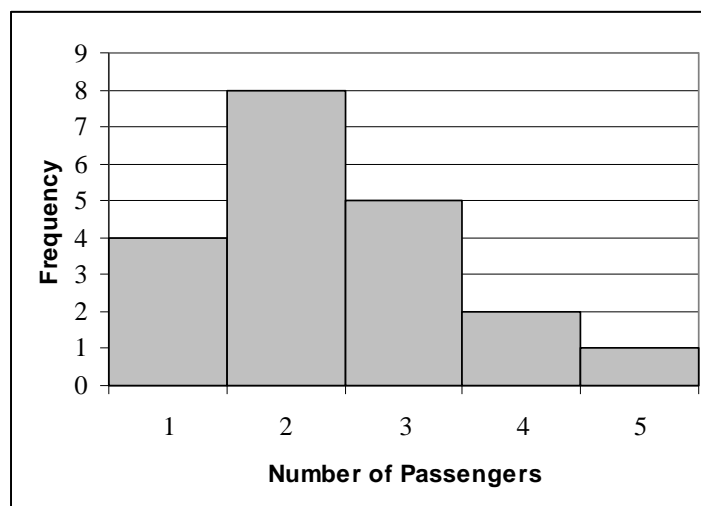
$\angle AOC =$ _____ reason: _____

$\angle ADC =$ _____ reason: _____

$\angle APC =$ _____ reason: _____

(8 marks)

11. (a) Alison counted the number of passengers in cars passing in front of her house. The histogram below shows her results.



- (i) How many cars had 3 passengers in them? _____ cars
- (ii) Find the **total** number of cars that passed in front of Alison's house.
 _____ cars

(3 marks)

11. (b) A small firm employs 10 people. The monthly salaries of nine of the employees are: €1000, €850, €626, €620, €614, €550, €550, €520, €500. The mean salary of the 10 employees is €653. Work out
- (i) the salary of the remaining employee,

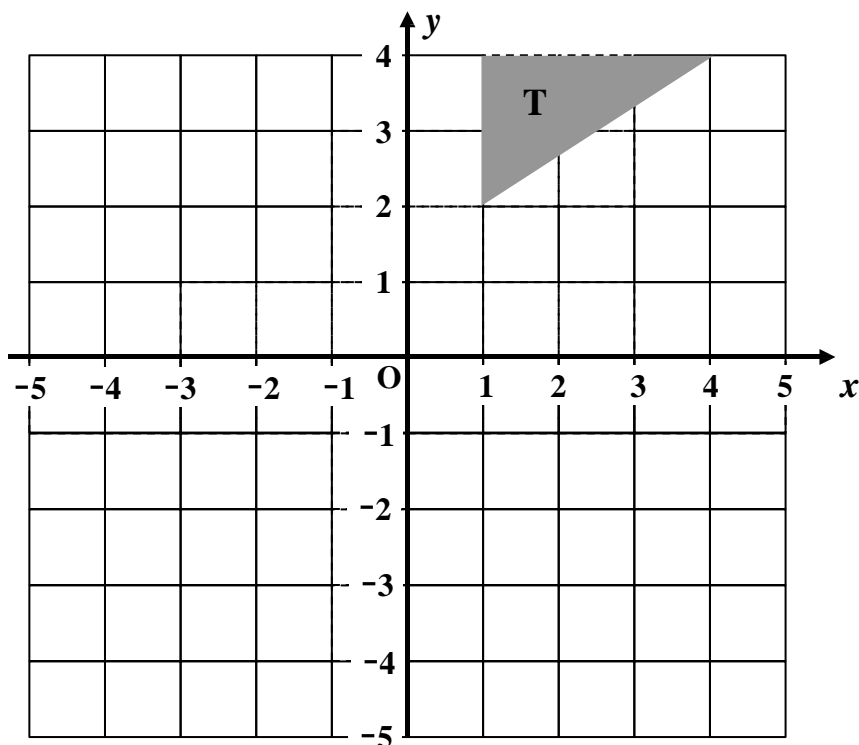
Remaining salary = € _____

- (ii) the median salary.

Median salary = € _____

(6 marks)

12. (a) T1 is the image of T when it is reflected in the **y-axis**. Draw and label T1
 (b) T2 is the image of T when it is reflected in the line **$y = x$** . Draw and label T2.
 (c) T3 is the image of T when it is **rotated** through **180°** about **$(0, 0)$** . Draw and label T3.

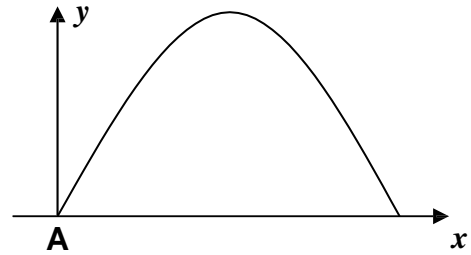


- (d) Describe the single transformation that will map T1 to T3.

(8 marks)

13. A goalkeeper kicks a ball from a point A.
The diagram shows the path of the ball.

The equation of the path of the ball is $y = 4x - \frac{x^2}{3}$.



- (i) Complete the table for $y = 4x - \frac{x^2}{3}$. (Round the values to 1 decimal place where necessary.)

x	0	2	4	6	8	10	12
$4x$	0	8	16			40	
$-\frac{x^2}{3}$	0	-1.3	-5.3			-33.3	
y	0	6.7	10.7			6.7	

- (ii) On the graph paper provided, draw the graph of $y = 4x - \frac{x^2}{3}$. Use 1 cm for 1 unit on both axes.

- (iii) Use your graph to find:

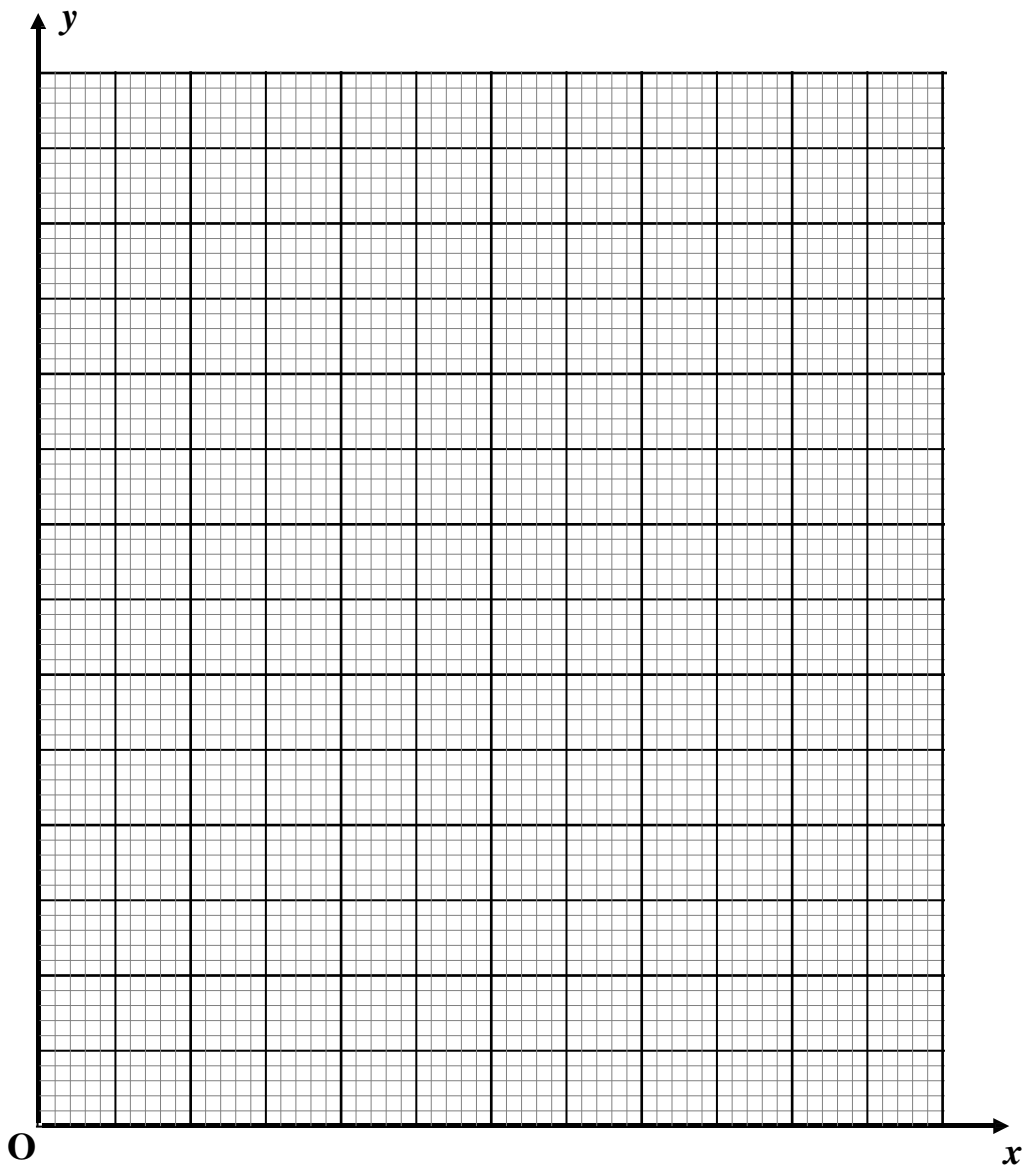
- (a) the **maximum height** of the ball,

Maximum height = _____ metres

- (b) the **value of x** when the ball falls back to the ground.

x = _____

(10 marks)



END OF PAPER