Preca College Korçë
Mathematics Entrance Exam
24th June 2013
Time: 8:00 - 10:00

Name: ______________________________ ***Index number:*** ________

INSTRUCTIONS TO CANDIDATES

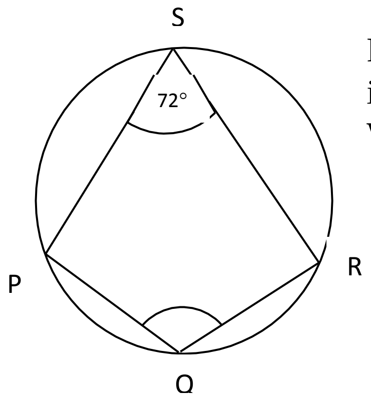
Section A: There is no need to show the working or to use the calculator.

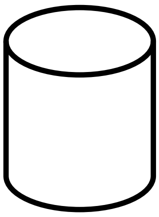
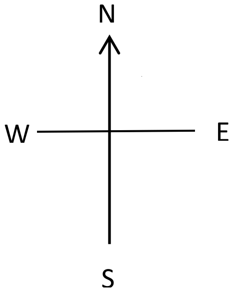
There are 20 questions to answer. Each question carries 1 mark.

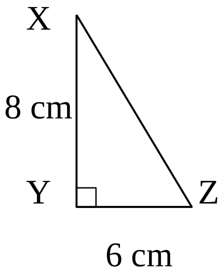
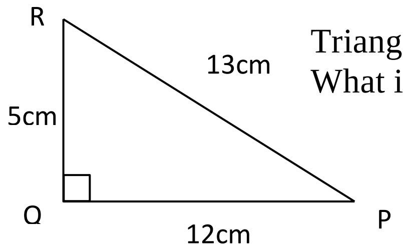
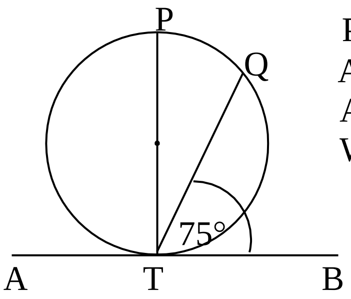
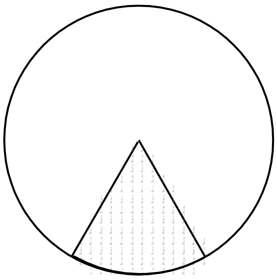
Section B: You are required to show the working where asked for.

Use of calculator and mathematical instruments are allowed.

Section A:

No.	QUESTION	SPACE FOR WORKING (IF REQUIRED)
1.	Find the value of 8.3 – 2 x 4. Ans:______	
2.	The **exterior** angle of a **regular** polygon is 36°. This regular polygon has: (A) 5 sides (B) 6 sides (C) 8 sides (D) 10 sides. Ans:______	
3.	What is the next **even** number after 88 ? Ans:______	
4.	In a bag there are 4 yellow marbles and 8 green marbles. Kenneth picks a marble at random from the bag. What is the probability that Kenneth picks a yellow marble? Ans:______	
5.	Given that 58 x 7.8 = 452.4, what is the value of 5.8 x 78 ? Ans:______	
6.	Which of the following is the **best estimate** for the **volume** of a cylinder of radius 4 cm and height 5 cm? (A) 120 cm^3 (B) 240 cm^3 (C) 120 cm^2 (D) 240 cm^2. Ans:______	
7.	Given that f(x) = 7x + 5 find the value of f(3) . Ans:______	
8.	4% of a certain sum of money is Lm18. What is the value of 6% of the same sum of money? Ans:______	
9	 PQRS is a cyclic quadrilateral in which ∠PSR is 72°. What is the size of ∠PQR? Ans:______	

No.	QUESTION	SPACE FOR WORKING (IF REQUIRED)
10.	The volume of the cylinder is $36\pi\text{cm}^3$. The area of the base is $9\pi\text{cm}^2$. Work out the height of the cylinder.  Ans:______	
11.	Adrian was using a spreadsheet. In cell **A1** he typed 30. In cell **B1** he typed 32. In cell **C1** he typed 34. Choose the correct formula that Adrian would type in cell **D1** to obtain the **average** of the entries in cells **A1, B1** and **C1**. (A) = **A1**+**B1**+**C1** (B) = **A1**+**B1**+**C1**/3 (C) = **A1 B1 C1** / 3 (D) = (**A1**+**B1**+**C1**)/3. Ans:______	
12.	 Maria was facing SW. She turned 90°**clockwise**. What direction is she now facing? (A) NW (B) NE (C) SE (D) SW. Ans:______	
13.	The marks obtained by 7 pupils in a Mathematics test were 2, 3, 4, 5, 6, 6, 8. John was one of these pupils and he obtained 5 marks. John's mark is the: (A) mean (B) mode (C) median (D) range. Ans:______	
14.	Which of the following is the **best estimate** for $\sqrt{64+16}$? (A) 12 (B) 9 (C) 8 (D) 4. Ans:__	

No.	QUESTION	SPACE FOR WORKING (IF REQUIRED)
15.	 Triangle XYZ is right-angled at Y. YZ is 6 cm long and XY is 8 cm long. What is the length of XZ? Ans:______	
16.	The angles of a triangle are in the ratio of 2 : 3 : 4. The size of the **smallest** angle is: (A) 9° (B) 40° (C) 80° (D) 120° . Ans:______	
17.	 Triangle PQR is right-angled at Q. What is the value of cos P ? Ans:____	
18.	 PT is a **diameter** of the circle. ATB is a **tangent** to the circle at T. Angle BTQ is 75°. What is the size of angle PTQ? Ans:______	
19.	Does the point with coordinates (2 , 5) lie on the straight line graph of $y = 3x - 1$? Ans:______	
20.	 The area of a circle is 330·6 cm^2. Find the area of the **shaded sector** of the circle if the angle at the centre is 60°. Ans:_____	

Section B:

1. a) Write 0·625 as a fraction in its lowest terms.

b) (i) Write the following numbers correct to 1 significant figure to give an estimate for P.

$$P = \frac{(24.37 \times 39.26)^2}{35.73 \times 79.37}$$

(ii) Use your calculator to work out the value of P correct to 3 significant figures.

____(4 marks)

2 a) Complete the sequence:

7, 10, 13, 16, _____, _____.

b) The nth term for the sequence above is 3n + 4. Find the 20th term of the sequence.

____(4 marks)

3. a) A shopkeeper bought a washing machine for €240. He then sold it at a profit of 15%.

Work out:
(i) the selling price of the washing machine

(ii) the profit.

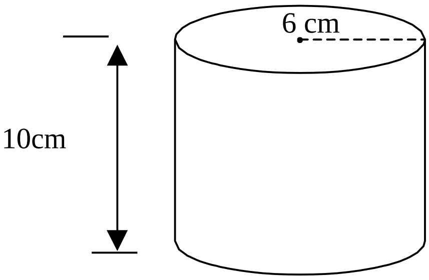
b) Aaron used a spreadsheet to calculate the interest on his Savings Account.
He entered the following data:

	A	B	C	D	E
1	Principal (€)	Rate (%)	Time (Years)	Interest (€)	
2	800	1·5	2	= A2*B2*C2/100	
3					

What value did Aaron obtain in cell D2?

(5 marks)

4.



A cylinder has a radius of 6 cm and a height of 10 cm.

(4 marks)

Work out:
a) the volume of the cylinder, correct to the nearest whole number

b) the curved surface area of the cylinder, correct to one decimal place.

5. The formula for the area of a trapezium is: $A = \frac{1}{2}(a + b)\,h$.

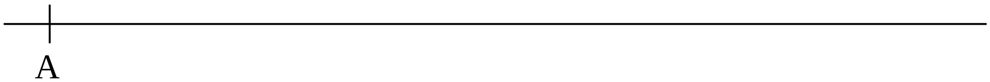
a) Work out the area of a trapezium when
$a = 12{\cdot}5$ cm, $b = 17{\cdot}5$ cm and $h = 8$ cm.

b) Make h the subject of the formula.

(4 marks)

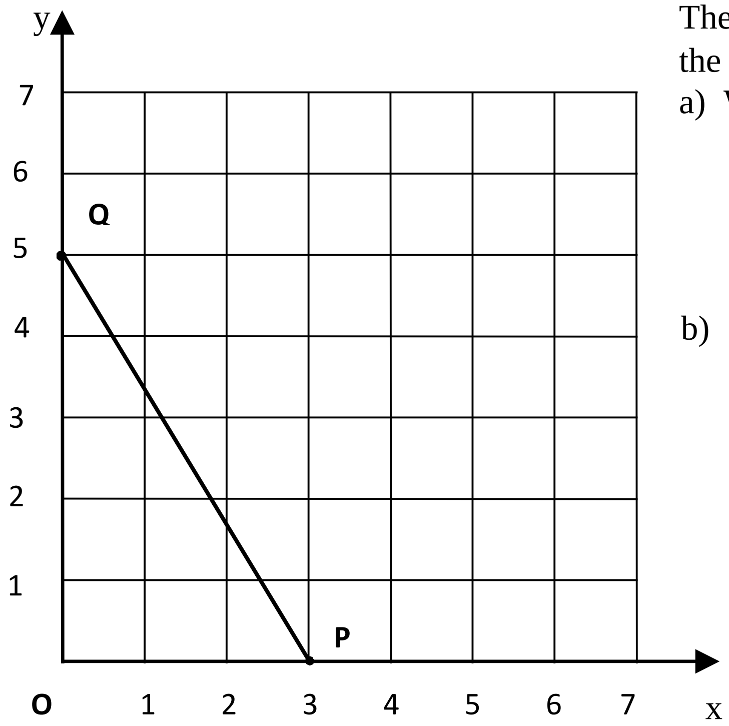
6. Use ruler and compasses only. All construction lines and arcs must be clearly shown.

a) Construct a triangle ABC in which AB = 8.5 cm, BC = 4 cm, and ∠ABC = 90°.
b) Construct the perpendicular bisector of BC. Let this bisector meet AC at D.
c) Measure and write down the size of ∠BDC.



(5 marks)

7.



The figure shows a straight line graph that cuts the x-axis at P and the y-axis at Q. (6 marks)

a) Write down:

(i) the coordinates of P P = (,)

(ii) the coordinates of Q. Q = (,)

b) Work out, showing **all your working**

(i) the area of Δ POQ

______ units^2

(ii) the length of PQ. (correct to 1 d.p.)

______ units

8. Two ordinary 6-sided dice are tossed.

a) Complete the possibility space diagram to show all the outcomes.

2nd dice

1st dice		1	2	3	4	5	6
	1	(1 , 1)	(1 , 2)	(1 , 3)	(1 , 4)	(1 , 5)	(1 , 6)
	2	(2 , 1)	(,)	(2 , 3)	(2 , 4)	(2 , 5)	(2 , 6)
	3	(3 , 1)	(3 , 2)	(,)	(3 , 4)	(3 , 5)	(3 , 6)
	4	(4 , 1)	(4 , 2)	(4 , 3)	(,)	(4 , 5)	(4 , 6)
	5	(5 , 1)	(5 , 2)	(,)	(5 , 4)	(5 , 5)	(5 , 6)
	6	(,)	(6 , 2)	(6 , 3)	(6 , 4)	(6 , 5)	(6 , 6)

b) Use the possibility space diagram to find the probability of obtaining:

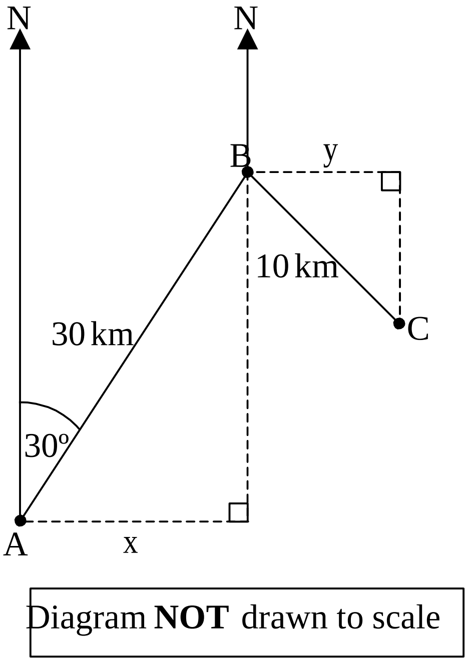
(i) a **double** __________

(ii) a **total score** of 8 __________

(iii) at **least one** prime number. __________

(6 marks)

9. A ship sails 30 km on a bearing of 030°
from A to B.
The ship then sails 10 km from B to C.



a) How far is B East of A? (distance x)

b) C is 22 km East of A.

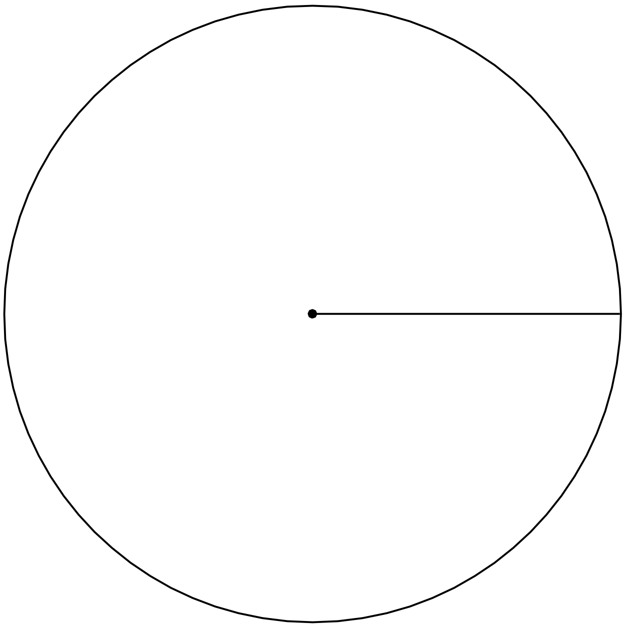
(i) How far is C East of B? (distance y)

(ii) Work out the bearing of C from B. Give your answer correct to the nearest degree.

(6 marks)

10 a) In a local election candidate A received three-eighths of the votes, candidate B received one-third of the votes, candidate C received one-quarter of the votes and candidate D received the remainder.

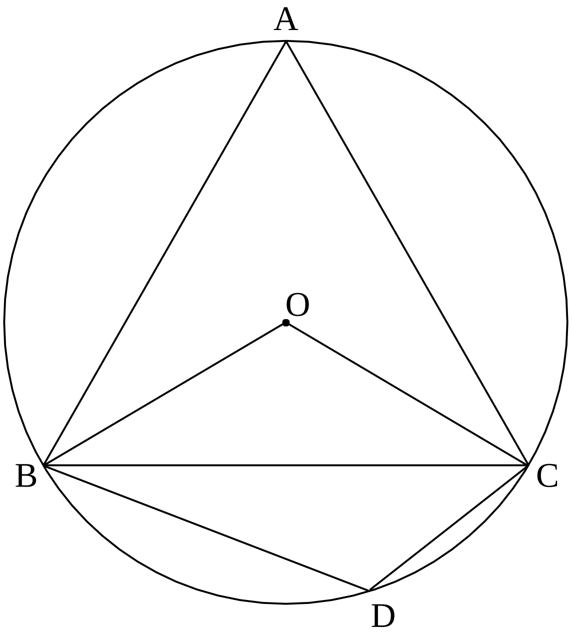
(i) Draw an accurate and clearly labelled pie chart to represent this information. Use the circle below.



(ii) If candidate B obtained 320 votes, how many people voted altogether?

b) The mean weight of a group of 17 teenagers is 45·5 kg. Joanne joins the group. The mean weight of the 18 teenagers now is 45.9 kg. Work out Joanne’s weight.

11 Triangle ABC is an equilateral triangle inscribed in a circle centre O.



a) Show all your working and give reasons for your answers.
Find each of the following angles:

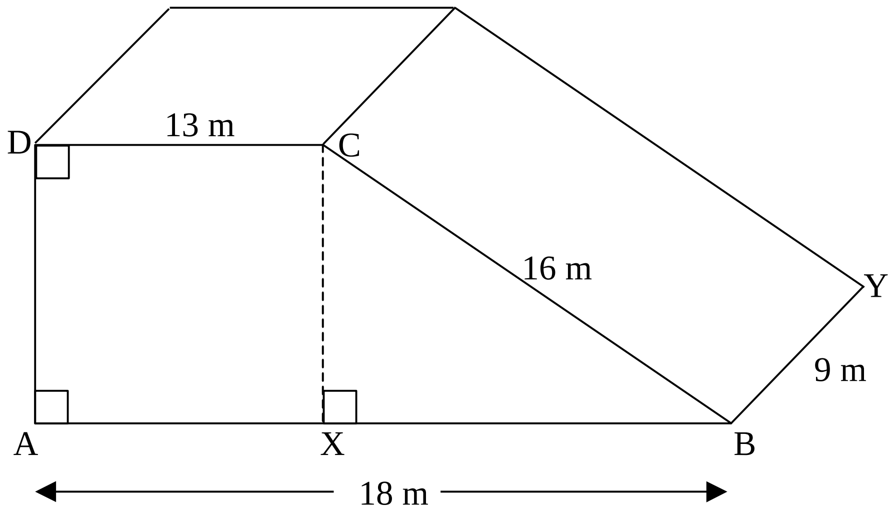
(i) angle AOB

(ii) angle ADB

b) The radius of the circle is 5 cm.
Work out, correct to three significant figures, the area of the minor sector OBC.

(7 marks)

12. a) The diagram shows a ramp of uniform cross-section. AB = 18 m, BC = 16 m, CD = 13 m and BY = 9 m.

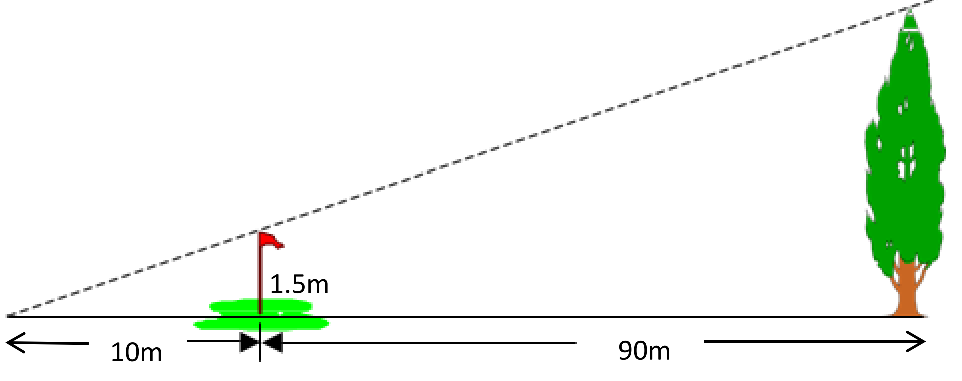


Work out, correct to three significant figures: (i) the height CX

(ii) the area of the cross-section, ABCD

(iii) the volume of the ramp.

(b) The shadow of a tree is 100 metres long and the shadow of a golf flag is 10 metres long. The two shadows coincide, as shown below. What is the height of the tree?

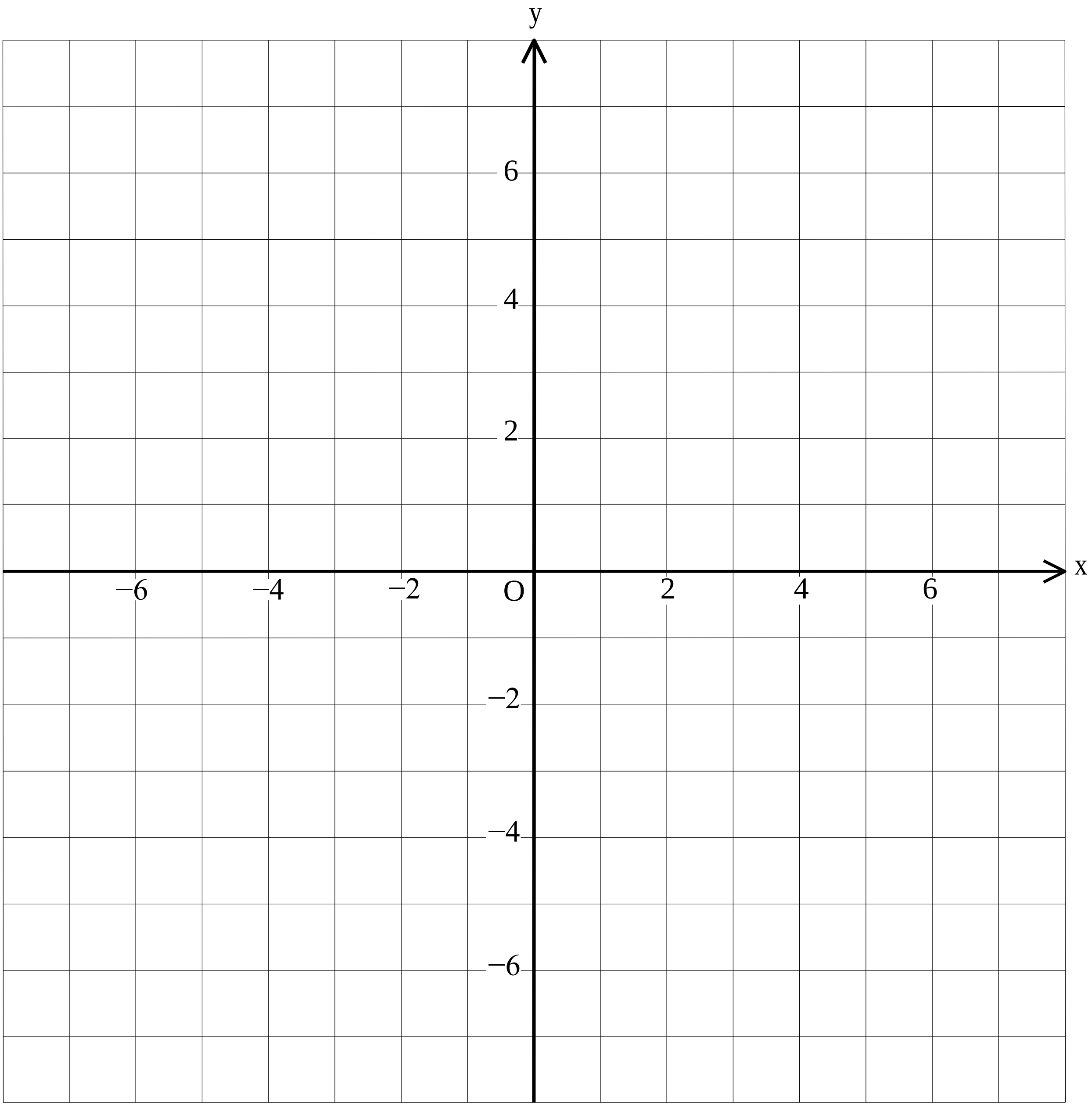


13. a) On the grid provided, plot and join the points A (3 , 2), B(6 , 2) and C(3 , 7) to obtain triangle ABC.

b) Reflect triangle ABC in the y-axis. Label the corresponding vertices of the image A'B'C'.

c) Rotate triangle ABC through 90° clockwise about (0 , 0). Label this image R.

d) Plot and draw the points (−2 , −4), (−5 , −4) and (−2 , 1) and label this figure T. Write down the column vector by which triangle A'B'C' is translated to obtain figure T.



(11 marks)

End of paper