Preca College Korçë

Mathematics Entrance Exam

30th June 2021

Time: 8:00 – 10:00

*Name:*_____   *Registration number:* _____

INSTRUCTIONS TO CANDIDATES

- Answer all the questions in the space provided.
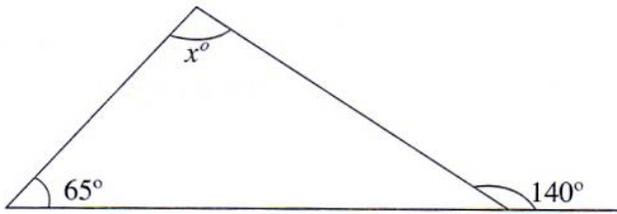- Calculators may be used but working should be shown clearly.

Q.1. (5 marks)

a. The perimeter of a square is **100cm.** Find the length of one side.

b. The area of a square is **100cm²**. Find the length of one side.
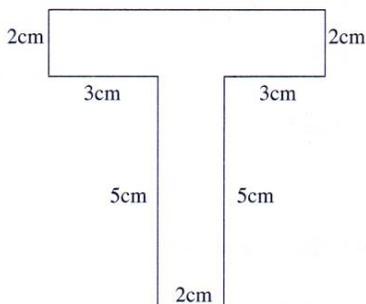
c. If 45% of *x* = 180, find *x*.

d.

Find x.

e. If $f(x) = 3x - 12$, find the value of x when $f(x) = 0$.
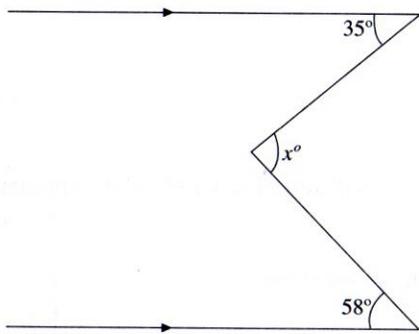
Q.2. (10 marks)

a. If $2^x = 4^2$. Find x.

b. The numbers **15,25** and x have an average (*mesatarja*) of 27. Find **x.**
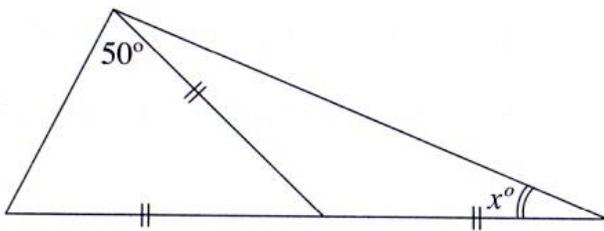
c. Find the perimeter of the diagram.

d. Find x.

e. Find the value of x.

Q.3. (5 marks)

If **c = -2** and **d = -3,** find the value of:

i.   **2c – 3d**

ii. **4cd – 1**

iii. **10 + 5cd**

iv. **40 – 6cd**

v.   **4cd – 20**

Q.4. (6 marks)

Complete these tables (*plotësoni tabelat*)

a	4	$\dfrac{1}{9}$	$\dfrac{9}{25}$	$\dfrac{49}{64}$	$\dfrac{x^4}{36}$	$\dfrac{25}{81}$
$\sqrt{a}$						

a	-1	$\dfrac{8}{27}$	$\dfrac{-x^3}{8}$	$\dfrac{x^3}{64}$	$\dfrac{4^3}{5^3}$	$\dfrac{-27}{125}$
$\sqrt[3]{a}$						

Q.5. (10 marks)

Find the value of (*kryeni veprimet*)

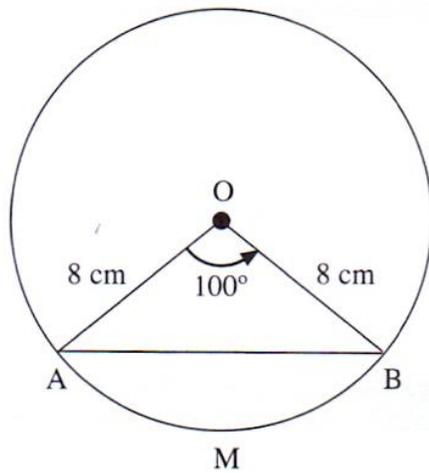**a.** $\sqrt[3]{\dfrac{-27}{8}}$

b. $\sqrt[5]{\dfrac{a^5}{32}}$

c. $\sqrt[4]{16a^8}$

d. $\sqrt[3]{2} \; \sqrt[3]{4}$

e. $\sqrt{\dfrac{3}{5}} \; \sqrt{\dfrac{125}{27}}$

Q.6. (6 marks)

Find:

a. The length of the arc (*harkun*) **AMB**

b. The area of the sector (*sektor*) **OAMB**.

Q.7. (6 marks)

Solve the equations (*zgjidhni ekuacionin*)

    a. $3x^2 + 4x - 4 = 0$ b. $x^2 - 6x + 9 = 0$

Q.8.   (12 marks)

Solve the simultaneous equations (*zgjidhni sistemin*)

    a. $x - y = 2$

          $x + y = 6$

    b. $2x - 3y = 5$

          $x + y = 4$

c. x + y = 7

3x − 2y = 1

Q.9. (5 marks)

The table below represents the number of persons, from different countries, attending a European Conference.

Country	ML	SP	IT	HO	GR	PL	FR	PR	BL	RO	CK
No. of persons	10	5	11	6	14	5	18	4	5	23	9

Use the list of numbers in the table to find the:

a. Mode (*moda*)

b. Median (*mesorja*)

c. Mean (mesatarja)

Q.10. (8 marks)

a.   In a class of **20 students**, two fifths are **boys.** In a mathematics test the **boys** got an average mark of 73.5% and the **girls** got an average mark of 80.0%. Calculate the average mark (*mesatarja*) for the **whole class.**

b.   In a family of six children their weights are as follows: 25 kg, 37 kg, 45 kg, 50 kg, 61kg and 70kg. What is the average weight of the children?

c.   When the weight of the Father is added to that of the Children, the new average weight (*mesatarja*) becomes 53 kg. What is the weight of the **Father** alone?

Q.11. (5 marks)

Rebecca has a Son called Isaac. This year, the age of the Mother plus the age of the Son are equal to 40 years. Next year, Rebecca will be six times as old as Isaac. How old are Rebecca and Isaac, this year?

Q.12. (6 marks)

Ester and **Pamela** decided to open a small supermarket in their own village. **Ester** invested €200 000 and **Pamela** invested € 300 000. They agreed to save 20% of their annual profit. The rest of the profit they will divide in proportion (*përpjesëtim*) to their investment. The first year they made a profit of € 90 000.

   a. How much of the profit did they save?

   b. How much profit did **Ester** make?

c. How much profit did **Pamela** make?

Q.13. (7 marks)

A person named **M.E.R.L.I.N.** placed the six separate letters of his name, in a bag.

a. If he picks **1 letter** at random (*rastësisht*), what is the probability it will be a **vowel** (*zanore*)?

b. If he picks 2 letters at random, what is the probability that the first letter will be **M** and the second letter will be **N**, in that order?

c. If he picks 3 letters at random, what is the probability that the three letters will be **M, R, N** in that order?

d. If he picks **2 letters** at random, what is the probability that both letters will be **vowels** (in any order)?

Q.14. (9 marks)

a.   A high television antenna makes a shadow **20m long** on the ground. **Petrit** wants to

calculate how high above the ground is the top of the antenna. He notices that a bus-stop sign,

2m high, produces a shadow of **80cm**, on the ground. How high is the television antenna?

b.   **Anila** is standing **20m** away from an apartment building. When she looks at the top of

the building, the angle of elevation (*këndi i ngritjes*), from her eyes is 45^0. **Anila's eyes** are **1.5m**

above the ground. How high is the building?

End of Paper - Good Luck