



Preca College
Mathematics Entrance Exam
1st July 2010
Time: 8:00 - 10:00

Name: _____

Index number: _____

Answer all questions.

1. Calculate, showing your workings:

(6 marks)

DO NOT
WRITE IN
THIS MARGIN

$$\sqrt{(50)}$$

.....
.....

Answer: _____

$$\sqrt[3]{(8a^3)}$$

.....
.....

Answer: _____

$$\sqrt{(0.01)}$$

.....
.....

Answer: _____

$$\sqrt{(36a^4)}$$

.....
.....

Answer: _____

2. Eliminate roots from denominator (*emeruesi i thyeses*) :

(6 marks)

DO NOT
WRITE IN
THIS MARGIN

a)
$$\frac{\sqrt{3}}{9 - \sqrt{2}}$$

.....
.....
.....

Answer: _____

b)
$$\frac{2a}{\sqrt{a} - \sqrt{2}}$$

.....
.....
.....

Answer: _____

3. ABCD is a quadrilateral (*katërkëndësh*). AB is parallel with DC, and angle A + angle B = 180°.

Prove that ABCD is a parallelogram.

(6 marks)

4. The sides of a triangle (*trekëndësh*) are 5cm, 8cm and 10cm long. Find the perimeter (*perimetër*) of the triangle formed by joining the mid-points of the given triangle.

(8 marks)

Answer: _____

5. The area of a trapezium is 140cm^2 . One of the parallel sides is 12cm long and the height is 7cm . Find the length of the other parallel side. (6 marks)

DO NOT
WRITE IN
THIS MARGIN

Answer: _____

6. M is the midpoint of side BC of triangle ABC. AM is elongated (*është e zgjatur*) to point D, such that $AM=MD$. Prove that: (6 marks)
- a.) ABDC is a parallelogram

b.) If angle A = 90° , then ABDC is a rectangle.

7. The sides of a rhombus (*romb*) are 8cm long and the acute (*të ngushtë*) angles are 30° . Find the diameter of the inscribed circle of the rhombus. (8 marks)

Answer: _____

8. ABC is a triangle. Bisector (*pergysmore*) of angle C meets AB at D. E lies on AC extended (*e zgjatur*) such that CD is parallel with BE. Prove that:

$$\frac{AD}{DB} = \frac{AC}{CB}$$

(8 marks)

DO NOT
WRITE IN
THIS MARGIN

9. Bisector AP of angle A in triangle ABC cuts BC at D and the circumscribed circle (*rreth që rrethon trekendshin*) at P.

Prove that triangles ABD and APC are similar and thus that $AB \cdot AC = AD \cdot AP$

(8 marks)

10. Prove that:

$$\frac{1}{1 + \cos \alpha} + \frac{1}{1 - \cos \alpha} = \frac{2}{\sin^2 \alpha}$$

(8 marks)

11. Two parallel planes cut a sphere of radius (*rreze*) 10cm. The circles formed by the planes and the sphere have radius 8cm and 6cm. Calculate the distances between the planes. (8 marks)

Answer: _____

12. Factorize:

(6 marks)

DO NOT
WRITE IN
THIS MARGIN

a. $3 + 27xy$

.....
.....
.....
.....

b. $8x^2y - 24xy$

.....
.....
.....
.....

c. $ax^2 + b^2x^2 - c^3x^2$

.....
.....
.....
.....

13. Find x:

(8 marks)

a. $(3x - 1)(2x - 5) = 0$

.....
.....
.....
.....

Answer: _____

b. $(x^2 - 1)(x^2 - 3x + 2) = 0$

.....
.....
.....
.....

Answer: _____

14. Is the following inequality (*inekuacion*) true?

(8 marks)

$$\frac{\sqrt{8} - 1}{3} \triangleright \frac{2}{\sqrt{8} + 1}$$

DO NOT
WRITE IN
THIS MARGIN

.....

.....

.....

.....

.....

.....

.....

.....