

Imię i nazwisko:

Klasa:

Grupa 2

Wynik:

**Question 1 (1 pt)**

$\cos(510^\circ)$  is equal to:

- A.  $-\frac{\sqrt{3}}{2}$       B.  $-\frac{\sqrt{2}}{2}$       C.  $\frac{\sqrt{2}}{2}$       D.  $\frac{\sqrt{3}}{2}$

**Question 2 (1 pt)**

If  $\sin \alpha = \frac{2}{5}$  and  $\alpha$  is an acute angle, then:

- A.  $\cos \alpha = \frac{\sqrt{21}}{5}$       B.  $\cos \alpha = -\frac{\sqrt{21}}{5}$       C.  $\operatorname{tg} \alpha = \frac{\sqrt{21}}{5}$       D.  $\operatorname{tg} \alpha = -\frac{\sqrt{21}}{5}$

**Question 3 (1 pt)**

The value of  $\operatorname{tg} 30^\circ \times \operatorname{tg} 35^\circ \times \operatorname{tg} 40^\circ \times \operatorname{tg} 45^\circ \times \operatorname{tg} 50^\circ \times \operatorname{tg} 55^\circ$  is

- A. 0      B.  $\frac{\sqrt{3}}{3}$       C. 1      D.  $\sqrt{3}$

**Question 4 (1 pt)**

If the value of  $\operatorname{tg} \alpha - \operatorname{ctg} \alpha = 5$ , then  $\operatorname{tg}^2 \alpha + \operatorname{ctg}^2 \alpha$  is equal to:

- A. 3      B. 23      C. 25      D. 27

**Question 5 (1 pt)**

In a triangle  $ABC$ ,  $|AB| = 10$ ,  $|AC| = 7$  and  $\cos \angle BAC = -\frac{1}{5}$ . The length of  $BC$  is equal to:

- A. 11      B.  $\sqrt{149}$       C. 13      D.  $\sqrt{177}$

**Question 6 (3 pts)**

Prove that if  $\alpha$  is an acute angle, then:

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

**Question 7 (3 pts)**

Given that  $\alpha$  is acute and  $\sin \alpha \times \cos \alpha = \frac{1}{4}$ , find the value of  $\sin^3 \alpha + \cos^3 \alpha$ .

**Question 8 (3 pts)**

Prove that in an acute triangle with heights  $h_a$  and  $h_b$  and the angle  $\gamma$ , the area is given by the formula:

$$P = \frac{h_a \times h_b}{2 \sin \gamma}$$

**Question 9 (3 pts)**

Given a triangle  $ABC$  with side-lengths:  $|AB| = 7, |AC| = 8$  and  $|BC| = 5$ , find the size of the angle  $\angle ACB$ .

**Question 10 (3 pts)**

In an obtuse triangle  $ABC$ ,  $|AB| = 4$ ,  $|AC| = 2\sqrt{6}$  and  $\angle ACB = 45^\circ$ . Find the size of the other two angles of the triangle.