

# Math 130 - Quiz 9 IC

October 30, 2019

Name key

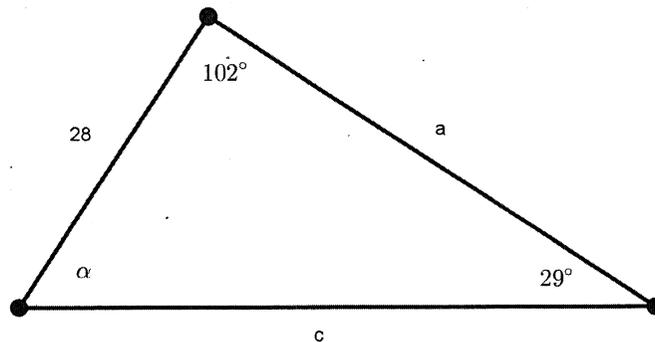
Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary. You must work individually on this quiz.

1. (3 points) Determine the angle  $\alpha$  and the side lengths  $a$  and  $c$ .

$$\alpha = 180^\circ - (102^\circ + 29^\circ)$$

$$\Rightarrow \alpha = 49^\circ$$



$$\frac{\sin 29^\circ}{28} = \frac{\sin 49^\circ}{a}$$

$$\Downarrow$$
$$a = 43.59$$

$$\frac{\sin 29^\circ}{28} = \frac{\sin 102^\circ}{c}$$

$$\Downarrow$$
$$c = 56.49$$

2. (2 points) A triangle has sides of lengths 11, 15, and 21. Find the measure of any one of the triangle's interior angles. Say which side is opposite your angle.

Opposite 11 ...  $11^2 = 15^2 + 21^2 - 2(15)(21) \cos \alpha \Rightarrow \alpha = 30.11^\circ$

Opposite 15 ...  $15^2 = 11^2 + 21^2 - 2(11)(21) \cos \beta \Rightarrow \beta = 43.16^\circ$

Opposite 21 ...  $21^2 = 11^2 + 15^2 - 2(11)(15) \cos \gamma \Rightarrow \gamma = 106.73^\circ$

# Math 130 - Quiz 9 TH

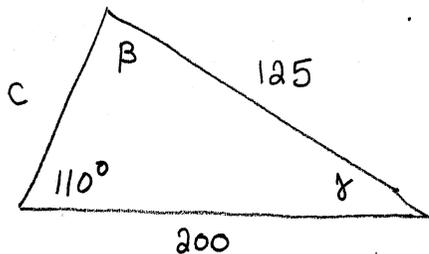
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Show all work to receive full credit. Supply explanations when necessary. You must work individually on this quiz. For each triangle described below,  $a$  is opposite  $\alpha$ ,  $b$  is opposite  $\beta$ , and  $c$  is opposite  $\gamma$ . This quiz is due November 4.

1. (2 points) Complete the triangle:  $\alpha = 110^\circ$ ,  $a = 125$ ,  $b = 200$ .



$$\frac{\sin 110^\circ}{125} = \frac{\sin \beta}{200}$$

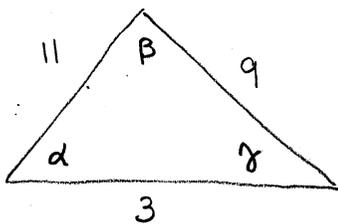
$$\sin \beta = 1.50$$

No such  $\beta$



No such  $\Delta$

2. (4 points) Complete the triangle:  $a = 9$ ,  $b = 3$ ,  $c = 11$ .



$$3^2 = 11^2 + 9^2 - 2(11)(9) \cos \beta$$

$$\Rightarrow \beta = 12.90^\circ$$

$$9^2 = 3^2 + 11^2 - 2(3)(11) \cos \alpha$$

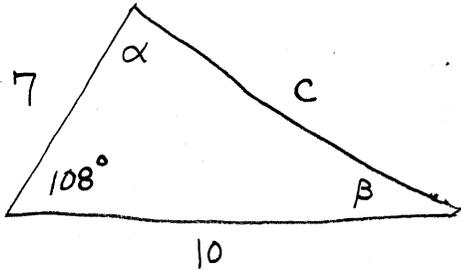
$$\Rightarrow \alpha = 42.06^\circ$$

$$11^2 = 3^2 + 9^2 - 2(3)(9) \cos \gamma$$

$$\Rightarrow \gamma = 125.04^\circ$$

Turn over.

3. (4 points) Complete the triangle:  $a = 10$ ,  $b = 7$ ,  $\gamma = 108^\circ$ .



$$c^2 = 7^2 + 10^2 - 2(7)(10) \cos 108^\circ$$
$$= 192.262$$

$$c = 13.87$$

$$7^2 = c^2 + 10^2 - 2(c)(10) \cos \beta$$

$$\Rightarrow \beta = 28.68^\circ$$

$$\alpha = 180^\circ - (108^\circ + 28.68^\circ)$$

$$\Rightarrow \alpha = 43.32^\circ$$