

## Math 4300 - Homework # 10

### Angle Measure

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1. In the Euclidean plane, let  $A = (0, 0)$ ,  $B = (-1, 1)$  and  $C = (1, 1)$ . Calculate  $m_E(\angle ABC)$ .

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2. In the Euclidean plane, let  $A = (0, 3)$ ,  $B = (0, 1)$  and  $C = (\sqrt{3}, 2)$ .

- (a) Find  $m_E(\angle ABC)$ ,  $m_E(\angle BCA)$ , and  $m_E(\angle CAB)$ .  
(b) Find the sum of the measure of the three angles:

$$m_E(\angle ABC) + m_E(\angle BCA) + m_E(\angle CAB)$$

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3. In the hyperbolic plane, let  $A = (1, 2)$ ,  $B = (1, 4)$  and  $C = (3, 4)$ . Calculate  $m_H(\angle ABC)$ .

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4. In the hyperbolic plane, let  $A = (0, 1)$ ,  $B = (0, 5)$  and  $C = (3, 4)$ .

- (a) Find  $m_H(\angle ABC)$ ,  $m_H(\angle BCA)$ , and  $m_H(\angle CAB)$ .  
(b) Show that the triangle  $\triangle ABC$  doesn't satisfy the Pythagorean theorem. That is,  $m_H(\angle ABC) = 90$  but

$$(AB)^2 + (BC)^2 \neq (AC)^2$$

- (c) Find the sum of the measure of the three angles:

$$m_H(\angle ABC) + m_H(\angle BCA) + m_H(\angle CAB)$$

Note that the angles sum up to less than  $180^\circ$ .

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