

NAME: _____

P.I. G.G.30: Investigate, justify, and apply theorems about the sum of the measures of the angles of a triangle

1. Can a right triangle contain an obtuse angle? Explain.
2. If the sum of two angles is equal to the third angle, then the triangle is a right triangle. Justify this algebraically.
3. Graph $3y - 2x = 11$ and the points $A(2, 5)$, $B(1, 1)$, and $C(4, 3)$ on the same coordinate plane. Use the triangle and the line to show that the sum of the angles in a triangle is 180° .

No, because one angle is a right angle, the other two angles have a sum of 90° ; therefore both must be less than 90° .

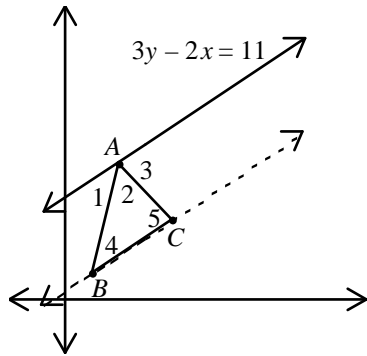
$$a + b = c$$

$$a + b + c = 180$$

$$c + c = 180$$

$$2c = 180$$

$$c = 90$$



\overleftrightarrow{BC} and $3y - 2x = 11$ are parallel because they both have a slope of $\frac{2}{3}$. $m\angle 1 + m\angle 2 + m\angle 3 = 180$

since they form a straight \angle . $\angle 1 \cong \angle 4$ and $\angle 5 \cong \angle 3$ by the Alternate Interior Angles Postulate. By

substitution, $m\angle 4 + m\angle 2 + m\angle 5 = 180$. Therefore the sum of the angles of $\triangle ABC$ is 180.
