

Is it possible to tell if two triangles ( $T_1$  and  $T_2$ ), as described below, are congruent? Explain why they are congruent, not congruent or why it is impossible to tell.

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1. Both triangles have a  $30^\circ$  angle, 2 cm side and 3 cm side.
2. Both triangles have three  $60^\circ$  angles.
3. Both triangles have a 3cm side,  $30^\circ$  angle and  $60^\circ$  angle.
4. Both triangles have a 3cm side, 4cm side and 5cm side.
5. Both triangles have a  $30^\circ$  angle,  $50^\circ$  angle and 3 cm side that is adjacent to the  $30^\circ$  angle but not included between the two angles.
6. Both triangles have a  $30^\circ$  angle,  $50^\circ$  angle and 3 cm side that is adjacent to the  $30^\circ$  angle.
7. Both triangles have two  $45^\circ$  angles and the side adjacent to both angles is 6 cm long.
8. Both triangles have two 7cm sides and an angle adjacent to both sides is  $70^\circ$ .
9. Both triangles have a 2 cm side, 3 cm side and the angle opposite to the 3 cm side is  $30^\circ$ .
10. Both triangles have a 2 cm side, 3 cm side and the angle opposite to the 2 cm side is  $30^\circ$ .

If you arrived at a conclusion that two triangle must be congruent, either explain it by reference to triangle congruence theorems we had or formulate a new tentative theorem that would capture your observation.

If you are using Geogebra exploration applets (<https://www.geogebra.org/m/dAzY8gRC>), here's a hint on how to manipulate the objects:

