In a triangle ABC, the sides are 6 cm, 10 cm and 14 cm. Show that the triangle is obtuse angled with the obtuse angle equal to 120o.

Solution:

Let a = 14, b = 10, c = 6

$\Rightarrow s = (a + b + c)/2 = 15.$

The largest angle is opposite to the largest side.

Hence $\tan A/2 = \sqrt{(s - b)(s - c)/s(s - a)}$

$= \sqrt{(5 \times 9/15} = \sqrt{3}$

$\Rightarrow A/2 = 60o \Rightarrow A = 120o.$

Alternative Method:

$\cos A = (b2 + c2 - a2)/2bc$

$= 100 + 36 - 196/120$

$= - 1/2$

$\Rightarrow A = 120o.$