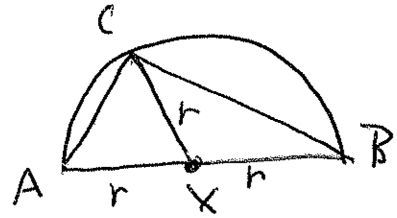
THEOREM. If $\triangle ACB$ is inscribed in a semicircle, it is a right angle.



$|\measuredangle TUV|$ = measure of $\angle TUV$ in degrees

Let X be the center of the circle, so segments [AX], [XB] and [CX] have length r.

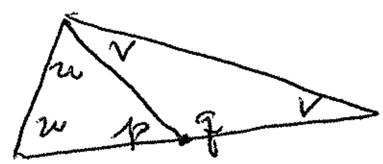
By Isosceles Triangles

$|\measuredangle XAC| = |\measuredangle XCA|$; call it u.

$|\measuredangle XBC| = |\measuredangle XCB|$; call it v.

Let $p = |\measuredangle CXA|$, $q = |\measuredangle CXB|$.

Since the angle sum of a triangle is 180°, we have



$$2u + p = 180^\circ$$
$$2v + q = 180^\circ$$

Also, $p + q = 180^\circ$.

Let's manipulate these equations.

Add the first two:

$$2u + 2v + p + q = 360^\circ$$

Subtract the third from this:

$$2u + 2v = 180^\circ$$

Divide by 2:

$$u + v = 90^\circ.$$

Since $|\measuredangle ACB| = u + v$, it follows that $\measuredangle ACB$ is a right angle.

According to later sources such as Herodotus and Proclus, this result was known to Thales, but there are no known primary sources.