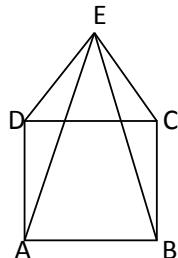


### Answer on Question #39637 – Math – Geometry

ABCD is a square and triangle EDC is an equilateral triangle. Prove that AE=BE and angle DAE=15

**Solution:**



As ABCD is a square, we have  $\angle ADC = \angle BCD = 90^\circ$ . As DEC is an equilateral triangle, then  $\angle EDC = \angle ECD = 60^\circ$ , and  $\angle EDA = \angle EDC + \angle ADC = 150^\circ$ ,  $\angle ECB = \angle ECD + \angle BCD = 150^\circ$ .

In triangles ADE and BCE,  $AD = BC$ ,  $\angle EDA = \angle ECB$ , As sides of equilateral triangle are equal, than  $ED = EC$ . Therefore  $\Delta ADE \cong \Delta BCE$

**Than  $AE = BE$ .**

Since ABCD is a square, than  $AB = BC = CD = AD$ , (1)  
since CDE is an equilateral triangle, than  $CD = DE = EC$ . (2)

From (1) and (2), we have

$AB = BC = AD = CD = DE = EC$ . (3)

In triangle DAE, by (3)

$AD = DE$ , than, as angles opposite to equal sides are equal,  $\angle DEA = \angle DAE$ .

In triangle DAE,

$\angle ADE + \angle DEA + \angle DAE = 180^\circ$ ,

$150^\circ + 2\angle DEA = 180^\circ$ .

We get,  $\angle DEA = \angle DAE = 15^\circ$ .

**QED**