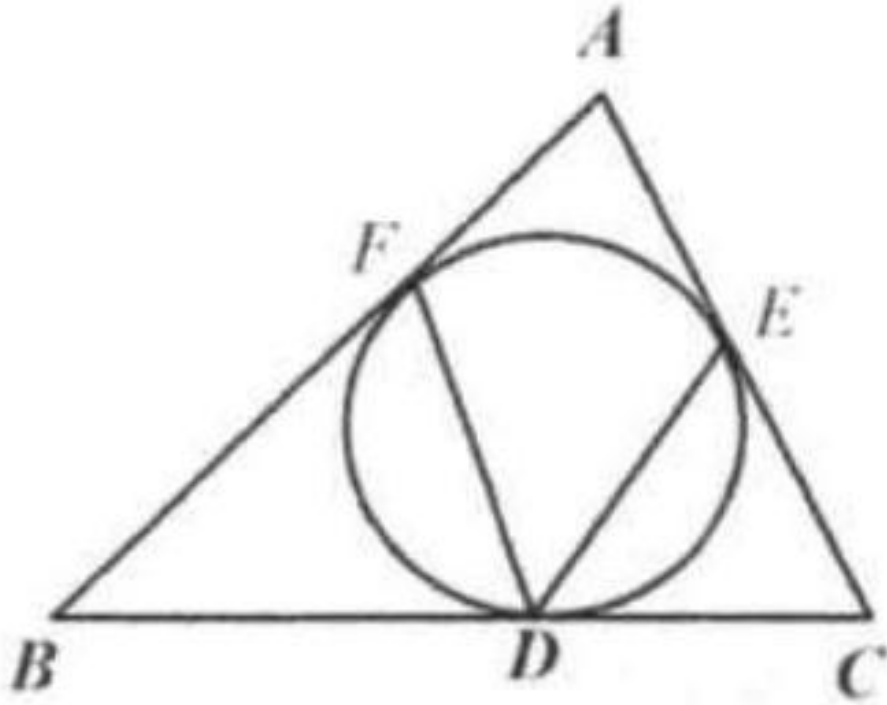


Problem 1

Problem

A circle is inscribed in triangle ABC . The tangent points are D, E, F as shown. Show that $\angle FDE = 90^\circ - \frac{1}{2}\angle A$.



Solution

Connect OE, OF .

Since both AF and AE are tangent to circle O , $AF \perp OF$, $AE \perp OE$, $\angle AFO = \angle AEO = 90^\circ$.

In quadrilateral $AFOE$, $\angle A + \angle FOE = 360^\circ - 2 \times 90^\circ = 180^\circ$.

So $\angle FOE = 180^\circ - \angle A$

But $\angle FDE = \frac{1}{2}\angle FOE$. So $\angle FDE = 90^\circ - \frac{1}{2}\angle A$.

