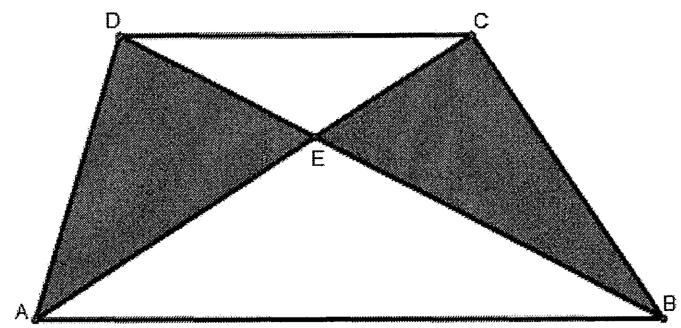
HW 7 Problem 7



We are given **CD || AB**.

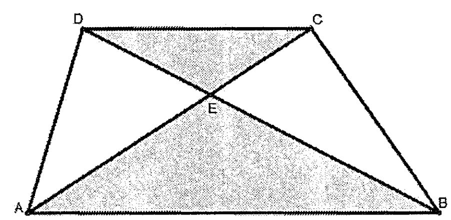
We want to show that **Area(ΔAED) = Area(ΔBEC)**.

By **Theorem 22**, **Area(ΔAED)** = $\frac{1}{2}$ **AE DE** $\sin(\measuredangle$ **AED**)

By **Theorem 22**, **Area(ΔBEC)** = $\frac{1}{2}$ **BE CE** sin ($\measuredangle$ **BEC**)

As **AC** crosses **BD** at **E**, by theorem 1 b), $\measuredangle$ **AED** = $\measuredangle$ **BEC**.

Now we want to show **AE ED = BE BC.**



As **DC** || AB, with AC and BD intersecting transversals,

by Theorem C, **ΔAEB ~ ΔCED.**

Then by **Basic Fact 4**, $\frac{BE}{DE} = \frac{AE}{CE}$.

By algebra, **AE DE = BE CE** .

Then by transitivity,

Area(ΔAED) = $\frac{1}{2}$ **AE DE** $\sin(\measuredangle$ **AED**) = $\frac{1}{2}$ **BE CE** sin ($\measuredangle$ **BEC**) = **Area(ΔBEC)**

Area(ΔAED) = Area(ΔBEC).