



Let  $\angle CQE = 2m$ , then  $\angle ECQ = \angle CEQ = 90^\circ - m$

$\angle CFE = m$ , so  $\angle FCQ = 90^\circ - m$  and  $\angle BCE = 180^\circ - (90^\circ - m) - (90^\circ - m) = 2m$

Since  $\angle BCD = \angle BAD = 2m$ ,  $\angle BAE = \angle EAD = m$  and triangle  $ABF$  is isosceles.

Triangle  $CEF$ , similar to  $BAF$ , is also isosceles and  $\angle CEF = \angle AED = m$ , therefore triangle  $AED$  is isosceles.

Since  $BC = AD$  and  $AD = DE$ ,  $BC = ED$ , and  $CQ = QE$

$\angle BCQ = \angle DEQ = 180^\circ - (90^\circ - m) = 90^\circ + m$ , making triangle  $BCQ$  congruent with triangle  $DEQ$  so  $BQ = DQ$  and triangle  $BQD$  is also isosceles.

$$\angle QBD = \angle QDB = \frac{180^\circ - 112^\circ}{2} = 34^\circ$$