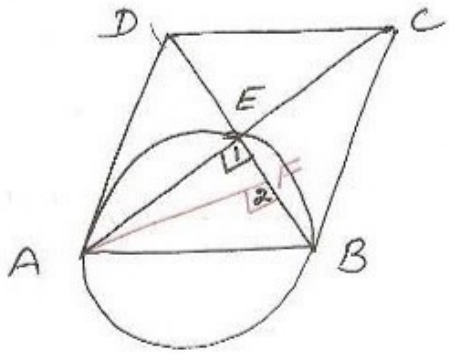
(5)



To Prove - circle with diameter AB passes through E

Proof - suppose circle does not pass through E.

let ⊙ passes through F

$\angle 1 = 90^\circ$ [diagonals of a rhombus are ⊥ to each other]

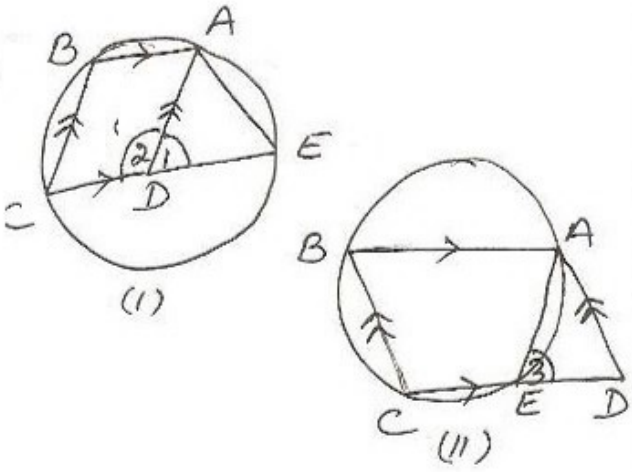
$\angle 2 = 90^\circ$ [angle in semi ⊙]

$\therefore \angle 1 = \angle 2$

But this is not possible ∵ exterior angle of △ (△AEF) cannot be equal to interior opp. angle

∴ our supposition is wrong and ⊙ pass thro E.

(6)



To Prove AD = AE

Proof fig (I)

□ ABCE is cyclic

$\therefore \angle B + \angle E = 180^\circ \ldots (i)$

$\angle 1 + \angle 2 = 180^\circ$ (linear pair axiom)

But $\angle 2 = \angle B$ [opp. angles of a ||gm]

$\angle 1 + \angle B = 180^\circ \ldots (ii)$

From (i) and (ii)

$\angle B + \angle E = \angle 1 + \angle B$

$\Rightarrow AD = AE$ [converse of isos. △ prop.]

fig (II)

$\angle 3 = \angle B$ [exterior angle prop of cyclic □]

But $\angle B = \angle D$ [opp. angles of a ||gm]

$\therefore \angle 3 = \angle D$

$\Rightarrow AD = AE$ [converse of isos. △ property]