

*Solution.* We have  $\angle B = 180^\circ - (36^\circ + 64^\circ) = 80^\circ = \angle ACD$ , which implies  $CD$  is tangent to the circumcircle of  $\triangle ABC$ . Then, by Power of a Point,

$$CD^2 = DE \cdot DA$$

$$1 = (3 - AE)3$$

$$AE = \boxed{\frac{8}{3}}.$$