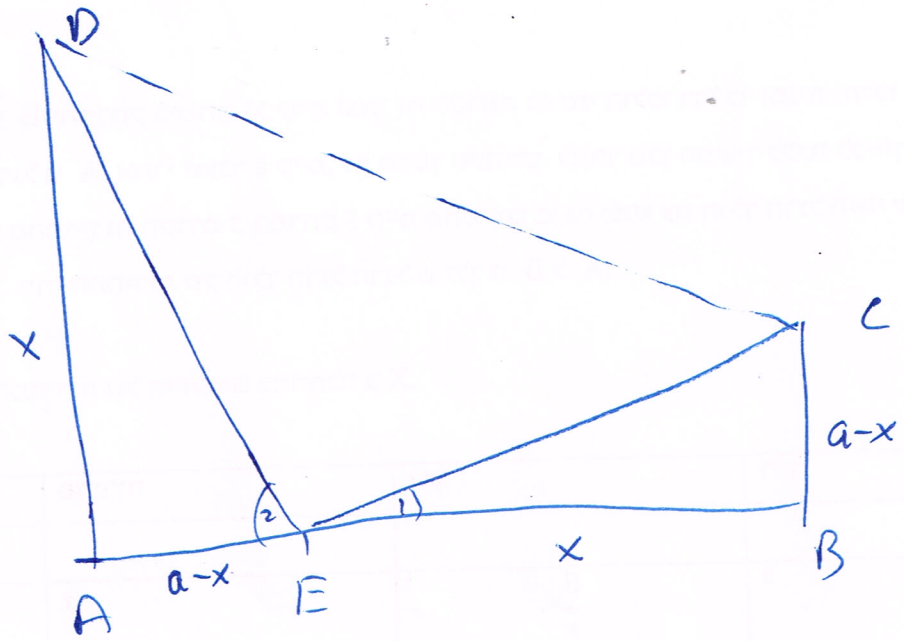
7.82



(3.5.3) $\triangle ADE \sim \triangle BEC$

$\Downarrow$

$\sphericalangle E_1 + \sphericalangle E_2 = 90^\circ$ $\qquad S_{DEC} = \frac{DE \cdot EC}{2}$

$$f = S_{DEC} = \frac{\sqrt{(a-x)^2+x^2} \cdot \sqrt{x^2+(a-x)^2}}{2} = \frac{2x^2-2ax+a^2}{2}$$

$$f = x^2 - ax + \frac{1}{2}a^2$$

$$f' = 2x - a$$

$$0 = 2x - a \rightarrow x = \frac{a}{2}$$

$$f'' = 2 > 0 \rightarrow \text{min}$$

$$f\left(\frac{a}{2}\right) = \frac{a^2}{4}$$