

$$\frac{1}{1} = \frac{CQ}{QB} = \frac{PB}{AP} \Rightarrow PQ \parallel AC \Rightarrow \angle AEP = 90^\circ = \angle EPQ$$

$$AC = 2PQ = 2a$$

$$AO = \frac{2}{3} \cdot 2a = \frac{4a}{3} \quad OC = \frac{1}{3} \cdot 2a = \frac{2a}{3}$$

$$\angle ESF = 90^\circ \Rightarrow SFO \quad \leftarrow SP \parallel DB \quad \text{פ"ק נ"מ}$$

$\angle O = 90^\circ$ פ"ק נ"מ (E, F, S) 90° ב"ק נ"מ 3 נ"מ/נ"מ SFOE נ"מ/נ"מ \leftarrow

$\triangle AOB$: נ"מ/נ"מ נ"מ/נ"מ

$$AB^2 = AO^2 + OB^2 = \left(\frac{4a}{3}\right)^2 + \left(\frac{2a}{3}\right)^2 \rightarrow \boxed{AB = \sqrt{2} \cdot \frac{4a}{3}}$$

$\triangle DOC$: נ"מ/נ"מ נ"מ/נ"מ

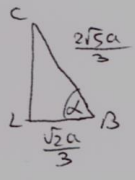
$$DC^2 = DO^2 + CO^2 = \left(\frac{2a}{3}\right)^2 + \left(\frac{2a}{3}\right)^2 \rightarrow \boxed{DC = \sqrt{2} \cdot \frac{2a}{3}}$$

$\triangle ADO$: נ"מ/נ"מ נ"מ/נ"מ

$$AD^2 = DO^2 + AO^2 = \left(\frac{2a}{3}\right)^2 + \left(\frac{4a}{3}\right)^2 \Rightarrow \boxed{\frac{2\sqrt{5}a}{3} = AD = DC}$$

AB ו- DC נ"מ/נ"מ נ"מ/נ"מ

$$CL = \sqrt{\frac{2ca^2}{9} - \frac{2a^2}{9}} = \sqrt{2}a$$



$$S_{ABCD} = \frac{\sqrt{2}a \left(\sqrt{2} \frac{4a}{3} + \sqrt{2} \frac{2a}{3} \right)}{2} = 2a^2$$