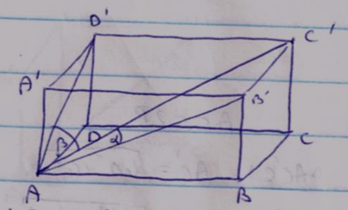
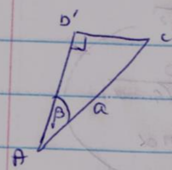
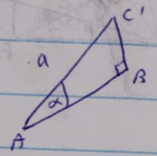
$\frac{3.75}{6}$

(א)



משולש $A'B'C'$ ישר זווית כי $C'B'$ מאונך לפאה $ABB'A'$ (ובפרט ל-AB')





$B'C' = a\sin\alpha$

בצורה דומה $AD'C'$ ישר זווית

$D'C' = a\sin\beta$

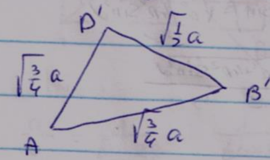
$(AC')^2 = AB^2 + BC^2 + C'C^2$

$a^2 = a^2\sin^2\beta + a^2\sin^2\alpha + C'C^2$

$C'C^2 = a^2(1 - \sin^2\beta - \sin^2\alpha)$

$V = AB \cdot BC \cdot C'C = a\sin\alpha \cdot a\sin\beta \cdot a\sqrt{1-\sin^2\beta-\sin^2\alpha} = a^3\sin\alpha\sin\beta\sqrt{\cos^2\beta-\sin^2\alpha}$

(ב) $B'C' = \frac{1}{2}a$ $\quad D'C' = \frac{1}{2}a$



כי הבסיס הוא ריבוע $C'C = \sqrt{\frac{1}{2}}a$

נמצא את זווית $\measuredangle A$ ע"פ משפט הקוסינוס

$\frac{1}{2}a^2 = \frac{3}{4}a^2 + \frac{3}{4}a^2 - 2 \cdot \frac{3}{4}a^2 \cos\measuredangle A$

$\cos\measuredangle A = \frac{a^2}{1.5a^2} = \frac{2}{3}$

$\sin\measuredangle A = \sqrt{1-\cos^2\measuredangle A} = \sqrt{\frac{5}{9}}$

$S_{AB'D'} = \frac{AD' \cdot AB' \cdot \sin\measuredangle A}{2} = \frac{\frac{3}{4}a^2 \cdot \sqrt{\frac{5}{9}}}{2} = \frac{\sqrt{5}a^2}{8}$