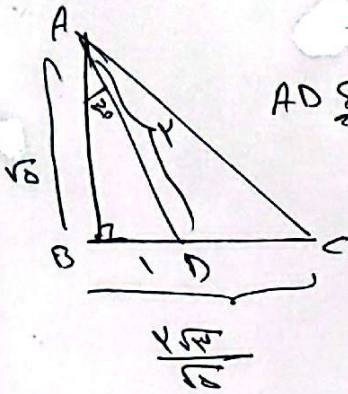


$$l_A = l_B \rightarrow \frac{4a}{8} \times r_A = \frac{4a}{10} \times r_B \rightarrow \frac{r_A}{r_B} = \frac{\frac{4a}{10}}{\frac{4a}{8}} = \frac{4}{5}$$

$$\frac{S_A}{S_B} = \left(\frac{r_A}{r_B}\right)^2 = \frac{4}{5}$$



$$AD = y \quad AB = \sqrt{y^2 + y^2} = \sqrt{2}y$$

$$S_{ABC} = \frac{AB \times BC}{2} = \frac{\sqrt{2}y \times \frac{y\sqrt{5}}{2}}{2} = \frac{y^2\sqrt{10}}{4}$$

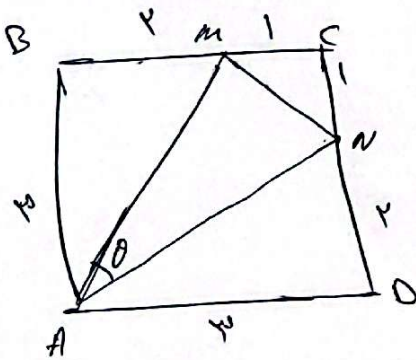
$$BC = \frac{y\sqrt{5}}{2}$$

$$AC^2 = AB^2 + BC^2 \rightarrow AC^2 = 2y^2 + \frac{5y^2}{4} = \frac{13y^2}{4} \rightarrow AC = \frac{y\sqrt{13}}{2}$$

$$\sin C = \frac{AB}{AC} = \frac{\sqrt{2}y}{\frac{y\sqrt{13}}{2}} = \frac{2\sqrt{2}}{\sqrt{13}}$$

$$\sin C = \frac{y\sqrt{5}}{2} \div \frac{y\sqrt{13}}{2} = \frac{\sqrt{5}}{\sqrt{13}}$$

$$\rightarrow \sin C = \frac{y\sqrt{5}}{y\sqrt{13}} = \frac{\sqrt{5}}{\sqrt{13}}$$



$$S_{AMN} = \frac{1}{2} \times AM \times AN \times \sin \theta$$

$$S_{ADN} = \frac{1 \times 1}{2} = \frac{1}{2}$$

$$S_{ABM} = \frac{1 \times 1}{2} = \frac{1}{2}$$

$$S_{MCN} = \frac{1 \times 1}{2} = \frac{1}{2}$$

$$AN = \sqrt{1^2 + 1^2} = \sqrt{2}$$

$$AM = \sqrt{1^2 + 1^2} = \sqrt{2}$$

$$S_{AMN} = \frac{1}{2} \times \sqrt{2} \times \sqrt{2} \times \sin \theta = \sin \theta$$

$$= \frac{1}{2} \times AM \times AN \times \sin \theta$$

$$\rightarrow \frac{1}{2} \times \sqrt{2} \times \sqrt{2} \times \sin \theta = \sin \theta$$

$$\rightarrow \sin \theta = \frac{1}{2}$$

Q. 6