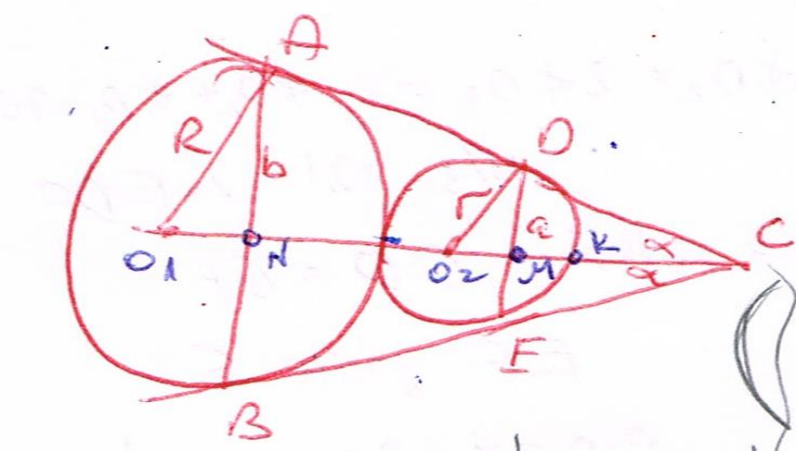

1.73

5 Jl $\triangle AO_1C \sim \triangle DO_2C$ (S.S)

$$\frac{O_1A}{O_2D} = \frac{O_1C}{O_2C}$$

$$\frac{R}{r} = \frac{R+2r+kc}{r+kc}$$

$$Rr + Rkc = Rr + 2r^2 + rkc$$

$$kc = \frac{2r^2}{R-r}$$

$$\sin\alpha = \frac{DO_2}{O_2C} = \frac{r}{r+\frac{2r^2}{R-r}} = \frac{(R-r)r}{Rr+r^2} =$$

$$= \frac{(R-r)r}{(R+r)r} = \frac{R-r}{R+r}$$

2 $\alpha = \angle O_2DE$

$$\sin\alpha = \frac{O_2M}{O_2D} = \frac{R-r}{R+r} = \frac{\frac{R}{R}-\frac{r}{R}}{\frac{R}{R}+\frac{r}{R}} = \frac{1-\frac{a}{b}}{1+\frac{a}{b}} = \frac{b-a}{b+a}$$

(S.S) $\triangle O_1AN \sim \triangle O_2DM$

$$\frac{r}{R} = \frac{\frac{1}{2}a}{\frac{1}{2}b}$$

$$\frac{r}{R} = \frac{a}{b}$$