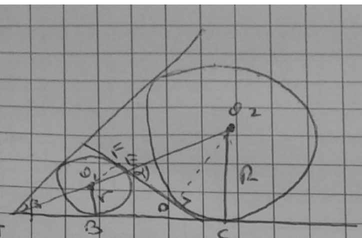
2.71
6



נציב את כל הקטעים

$$AO_2 = AO_1 + O_1E + EO_2$$

$$\frac{R}{\sin\beta} = \frac{r}{\sin\beta} + \frac{r}{\sin\alpha} + \frac{R}{\sin\alpha}$$

$$R\left(\frac{1}{\sin\beta} - \frac{1}{\sin\alpha}\right) = r\left(\frac{1}{\sin\beta} + \frac{1}{\sin\alpha}\right)$$

$$\frac{R}{r} = \frac{\frac{1}{\sin\beta} + \frac{1}{\sin\alpha}}{\frac{1}{\sin\beta} - \frac{1}{\sin\alpha}} = \frac{\frac{\sin\alpha + \sin\beta}{\sin\alpha\sin\beta}}{\frac{\sin\alpha - \sin\beta}{\sin\beta\sin\alpha}} =$$

$$\frac{R}{r} = \frac{\sin\alpha + \sin\beta}{\sin\alpha - \sin\beta} = \frac{2\sin\frac{\alpha+\beta}{2}\cos\frac{\alpha-\beta}{2}}{2\sin\frac{\alpha-\beta}{2}\cos\frac{\alpha+\beta}{2}}$$

$$\boxed{\frac{R}{r} = \tan\frac{\alpha+\beta}{2}\cot\frac{\alpha-\beta}{2}}$$

$\triangle AO_1B$:

$$\frac{BO_1}{AO_1} = \sin\beta$$

$$\boxed{AO_1 = \frac{r}{\sin\beta}}$$

$\triangle EO_2D$:

$$\frac{O_2D}{O_2E} = \sin\alpha$$

$$\boxed{EO_2 = \frac{R}{\sin\alpha}}$$

$\triangle AO_2C$:

$$\frac{O_2C}{AO_2} = \sin\beta$$

$$\boxed{AO_2 = \frac{R}{\sin\beta}}$$

$\triangle O_1FE$:

$$\frac{O_1F}{O_1E} = \sin\alpha$$

$$\boxed{O_1F = \frac{r}{\sin\alpha}}$$