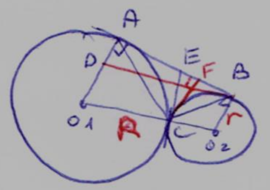
1.95
5

א.



$\angle O_1AC = \angle O_1CA = \alpha$
$\angle AO_1C = 180 - 2\alpha$
~~$\angle CO_2B = \angle O_2$~~
$\angle BCO_2 = \angle CBO_2 = \beta$
$\angle CO_2B = 180 - 2\beta$

$180^\circ = \angle AO_1C + \angle CO_2B$
$180 = 180 - 2\alpha + 180 - 2\beta \rightarrow 2\alpha + 2\beta = 180^\circ$
$\alpha + \beta = 90^\circ$

$\angle O_1CO_2 = \angle O_1CA + \angle ACB + \angle O_2CB$
$180 = \alpha + \angle ACB + \beta \rightarrow \angle ACB = 90^\circ$

ב.

$\angle AO_1C = \angle ADB = 180 - 2\alpha$ (מתאימות)
$\angle EAC = 90 - \angle O_1AC = 90 - \alpha$
$AE = EC$ (2 משיקים היוצאים...)
$\angle ACE = 90 - \alpha$
(חיצונית ל $\triangle AEC$) $\angle FEC = \angle EAC + \angle ACE = 180 - 2\alpha$
$\angle O_1AB = 90 = \angle EFC$
⇓
(s.s) $\triangle ADB \sim \triangle FEC$

ג.

$AB = \sqrt{DB^2 - AD^2}$
$= 2\sqrt{Rr}$

$DB = R + r$ ← מקבילית DBO_2O_1
$AD = AO_1 - DO_1 = R - r$

ד. נתבקשנו למצוא את CF
נשתמש בדמיון שהוכח בסעיף ב

$$\frac{BD}{CE} = \frac{AB}{CF}$$

$$\frac{R+r}{\frac{1}{2}AB} = \frac{AB}{CF}$$

$$CF = \frac{\frac{1}{2}AB^2}{R+r} = \frac{\frac{1}{2}\cdot 4Rr}{R+r}$$

$$CF = \frac{2Rr}{R+r}$$