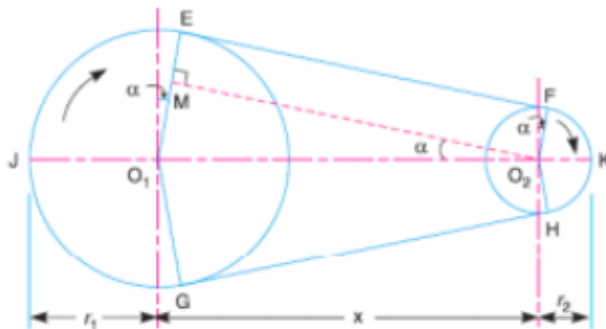---

Formulae to calculate the length of open belt drive and length of Cross belt drive

Question:
State the formulae to calculate the length of open belt drive and cross belt drive. State the meaning of each term by drawing suitable diagrams in both cases.

Answer:
Formulae to calculate the length of open belt drive :

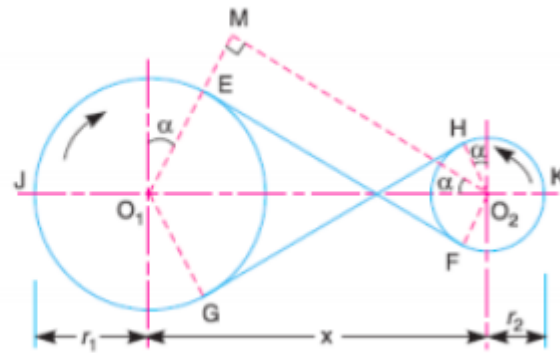$$L = \pi(r_1 + r_2) + 2x + \frac{(r_1 - r_2)^2}{x}$$

Where,

r_1 and r_2 = Radii of the larger and smaller pulleys,

x = Distance between the centres of two pulleys (*i.e.* O_1 O_2),

L = Total length of the belt.

α = angle of lap

Formulae to calculate the length of Cross belt drive

$$L = \pi(r_1 + r_2) + 2x + \frac{(r_1 + r_2)^2}{x}$$

Where,

r_1 and r_2 = Radii of the larger and smaller pulleys,

  x = Distance between the centres of two pulleys (*i.e.* O_1 O_2),

  L = Total length of the belt.

  α = angle of lap