
The central distance two shaft is 4m having two pulleys .....

Question:

The central distance two shaft is 4m having two pulleys with diameter having 500mm and 700mm respectively find the length of belt required -

(1) for open belt drive

(2) for cross belt drive

Answer:

Central distance between two shafts; C = 4 Meters; = 4000 mm.

Smaller pulley diameter = d = 500 mm; Smaller pulley radius = r= 250 mm;

Larger pulley diameter = d = 700 mm; lager pulley radius = r= 350 mm;

Angle subtended by each tangent β

a) Length of open belt drive

Angle subtended by each tangent $\beta = \sin^{-1}(R-r/C) = \sin^{-1}((350-250)/4000)$

$B = 0.025$ radians

$L_O = \pi (R + r)2x\ \beta\ (R-r) + 2\ C\ x \cos \beta = 9.889$ m **$L_O = 9.889$ m**

b) Length of cross belt drive

Angle subtended by each tangent $\beta = \sin^{-1}(R+ r/C) = \sin^{-1}((350+250)/4000)$

$\beta = 0.01575$ radians

$L_C = \pi (R + r)2x\ \beta\ (R-r) + 2\ C\ x \cos \beta = 9.903$ m **$L_C = 9.903$ m**