

2-2

$l_{BC} = 50\text{mm}$, $l_{CD} = 35\text{mm}$, l_{AD}
 $= 30\text{mm}$, AD

1
 AB l_{AB}

2
 l_{AB}

3
 l_{AB}

Grashoff

1 AB l_{AB} $l_{BC} + l_{CD} + l_{AD}$

$l_{AB} = 15\text{mm}$

2 AD l_{AD} $l_{AB} + l_{BC} + l_{CD}$

1 BC l_{BC} $l_{AB} + l_{AD} + l_{CD}$

$l_{AB} = 45\text{mm}$

45mm l_{AB} 50mm

2 AB l_{AB} $l_{BC} + l_{CD} + l_{AD}$

$l_{AB} = 55\text{mm}$

50mm l_{AB} 55mm

l_{AB}

$$45\text{mm} < I_{AB} < 55\text{mm}$$

(3)

$$\frac{I}{2} \quad \frac{I}{2} \quad \frac{I}{2} \quad AD$$

$$1 \quad I_{AB} < 30\text{mm} \quad AB \quad BC$$

$$I_{AB} + I_{BC} > I_{CD} + I_{AD}$$

$$I_{AB} > 15\text{mm}$$

$$15\text{mm} < I_{AB} < 30\text{mm}$$

$$2) \quad I_{AB} \quad AD \quad BC$$

$$I_{AD} + I_{BC} > I_{AB} + I_{CD}$$

$$I_{AB} < 45\text{mm}$$

$$30\text{mm} < I_{AB} < 45\text{mm}$$

$$3 \quad I_{AB} > 100 \quad AB \quad AD$$

$$I_{AB} + I_{AD} > I_{BC} + I_{CD}$$

$$I_{AB} > 55 \text{ mm}$$

$$AB \quad BC \quad CD$$

$$I_{AB} < (I_{BC} + I_{CD}) + I_{AD}$$

$$I_{AB} < 115 \text{ mm}$$

$$55 \text{ mm} < I_{AB} < 115 \text{ mm}$$

$$I_{AB}$$

$$15 < I_{AB} < 45, 55 < I_{AB} < 115$$

$$I_{AB}$$

I_{AB}

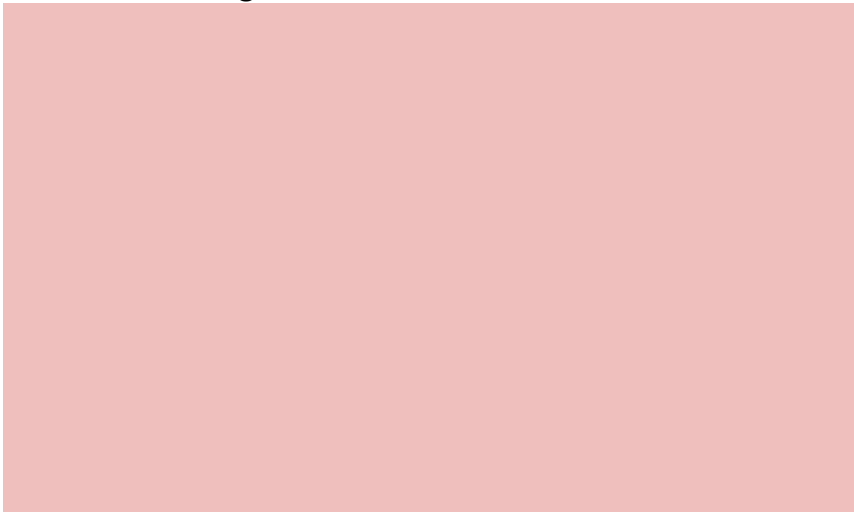
0 220mm

 I_{AB}

2-3

 $I_{AB} \quad I_{AD} \quad I_{BC} \quad I_{CD}$ $AC_1 \quad I_{AB} \quad I_{BC} \quad 80$ $AC_2 \quad I_{BC} \quad I_{AB} \quad 24$ $C_2AD \quad C_1AD$

$$\cos \left[\frac{(AC_2^2 + AD^2 - C_2D^2)}{2 \cdot AC_2 \cdot AD} \right] = \cos \left[\frac{(24^2 + 72^2 - 50^2)}{2 \cdot 24 \cdot 72} \right]$$

$$\cos \left[\frac{(24^2 + 72^2 - 50^2)}{2 \cdot 24 \cdot 72} \right] = \cos \left[\frac{(0^2 + 72^2 - 50^2)}{2 \cdot 0 \cdot 72} \right]$$


1.23

min

$$\begin{aligned} \cos \left[\frac{(CD^2 + BC^2 - (CD - AB)^2)}{2 \cdot CD \cdot BC} \right] &= 51.06^\circ \\ \cos \left[\frac{(CD^2 + BC^2 - (CD + AB)^2)}{2 \cdot CD \cdot BC} \right] &= 157.26^\circ \end{aligned}$$



$$180^{\circ} - 2$$

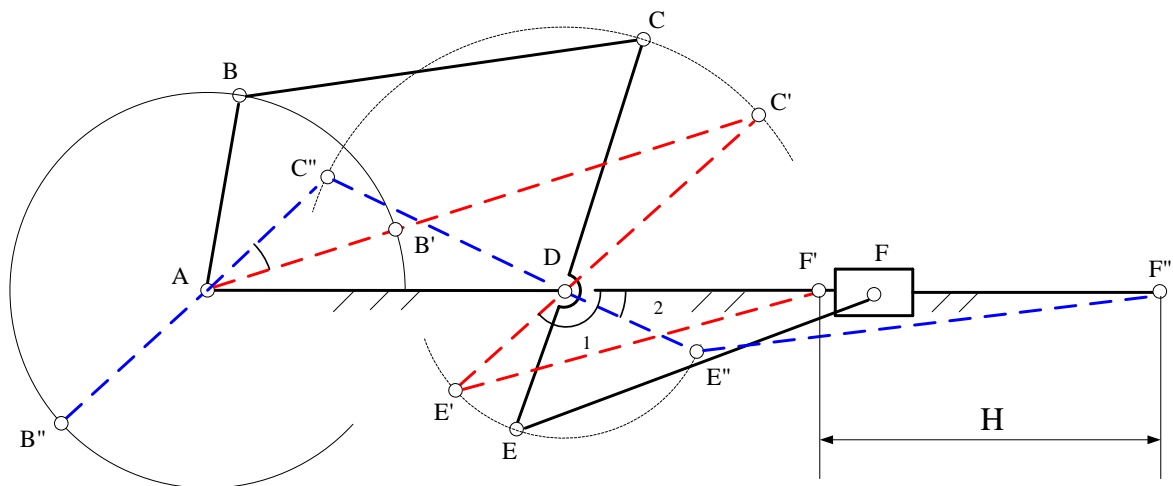
$$\min 22.74^{\circ}$$

$$\begin{aligned} & \frac{B_1 D C_1}{\cos \left(\frac{B_1 D^2 + C_1 D^2 - B_1 C_1^2}{2 \cdot \frac{1}{2} B_1 D \cdot \frac{1}{2} C_1 D} \right)} = \frac{B_2 D C_2}{\cos \left(\frac{B_2 D^2 + C_2 D^2 - B_2 C_2^2}{2 \cdot \frac{1}{2} B_2 D \cdot \frac{1}{2} C_2 D} \right)} \\ & \cos \left(\frac{44^2 + 50^2 - 52^2}{2 \cdot 44 \cdot 50} \right) = \cos \left(\frac{100^2 + 50^2 - 52^2}{2 \cdot 100 \cdot 50} \right) \\ & 70.55^{\circ} \end{aligned}$$

2-4

$$l_{AB} = 30mm, l_{BC} = 55mm, l_{AD} = 50mm, l_{CD} = 40mm, l_{DE} = 20mm, l_{EF} = 60mm$$

	1	ABCD	2		K	3	F	H
4		min		max				
5	DF							



1 ABCD

2 K ABCD K.

$$\frac{DAC}{DAC} = 35.3 \quad K \quad \frac{180}{180} = 1.49$$

3 ACD ACD

$$\cos \theta_1 = \frac{l_{AD}^2 + l_{CD}^2 - (l_{AB} + l_{BC})^2}{2 l_{AD} l_{CD}} = 0.78125$$

$$\cos \theta_2 = \frac{l_{AD}^2 + l_{CD}^2 - (l_{BC} + l_{AB})^2}{2 l_{AD} l_{CD}} = 0.86875$$

DEF DEF

$$DF = 43mm \quad DF = 77mm \quad H = DF = DF = 34mm$$

$$4 \quad \quad \quad DE \quad DF \quad \min \quad \arccos \frac{DE}{EF} = 70.5$$

CD DF

$$E \quad \arccos \frac{DE \sin(180 - \theta_1)}{EF} = 78.0$$

$$E \quad \arccos \frac{DE \sin \theta_2}{EF} = 80.5 \quad \max \quad 80.5$$

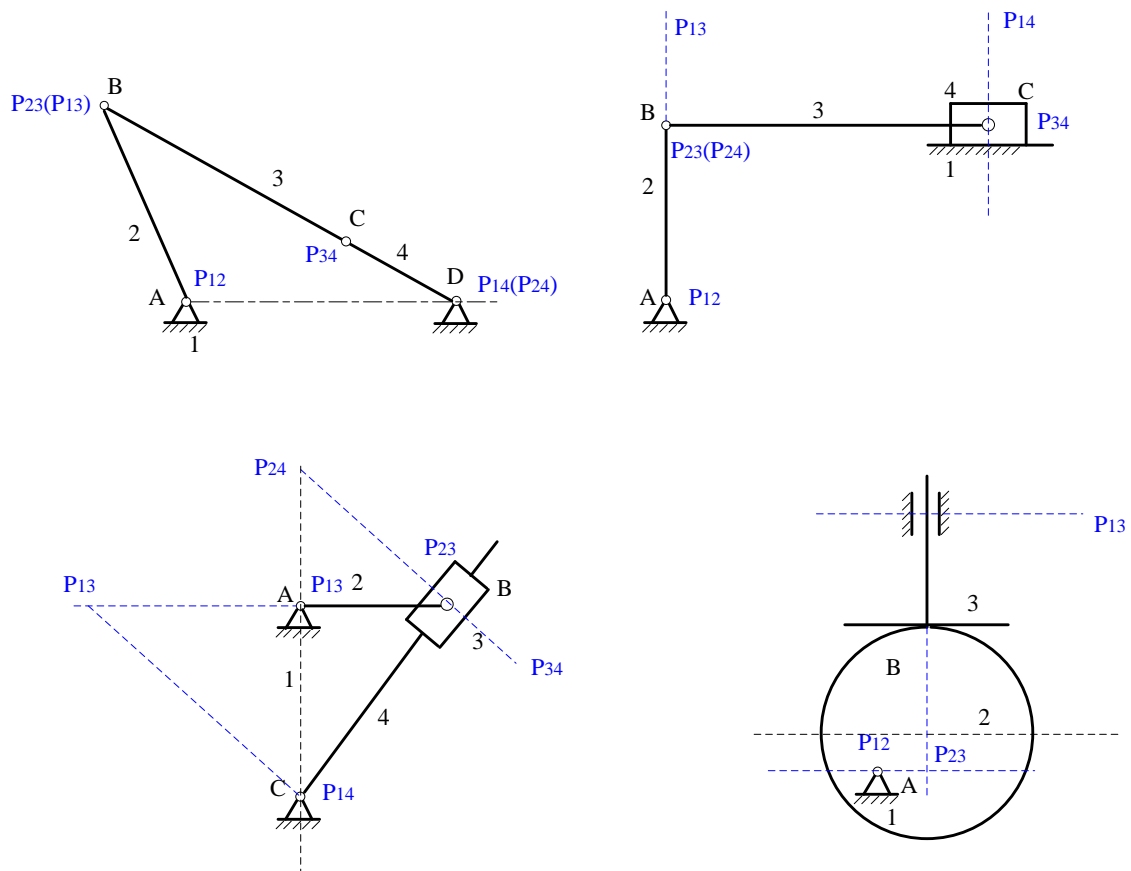
5 DF DF

$$\cos \theta = \frac{r \sin \phi}{l} \quad e = r \quad l$$

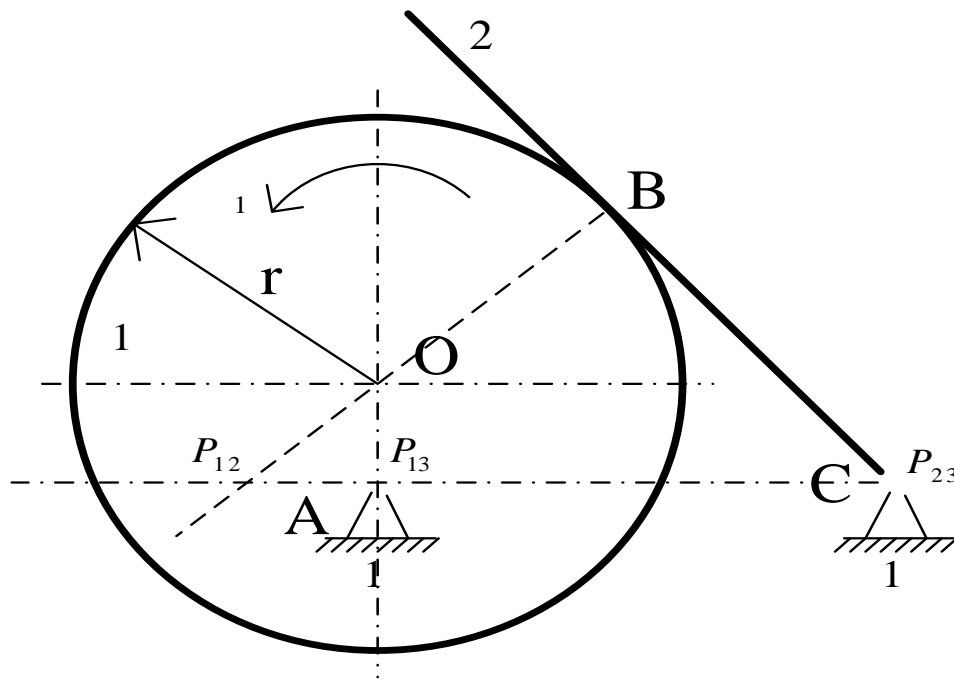
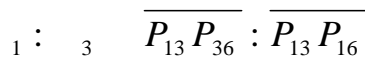
2

3 max min

2-8



3



$$OAP_{12} \quad CBP_{12} \quad \frac{l_{AP_{12}}}{l_{BP_{12}}} \quad \frac{l_{OR_{12}}}{l_{CP_{12}}}$$

$$l_{AP_{12}} \quad x \quad \frac{x}{50 \sqrt{22^2 x^2}} \quad \frac{\sqrt{22^2 x^2}}{80 x} \quad x=28.6 \quad 1 \quad l_{AP_{12}} \quad 2 \quad l_{CP_{12}}$$

$\omega_2 = 2.63 \text{ rad/s}$

