Grashof condition:

$L_{max} + L_{min} \leq L_a + L_b$

4-bar linkage condition:

$L_{max} \leq L_{min} + L_a + L_b$

Crank-rocker ⇒ shortest link next to fixed link

Drag-link ⟶ shortest link is fixed link

Double-rocker → shortest link is opposite the fixed link

Actual no. of joints = number of links attached to joint − 1

Circular pitch : $p_c = \frac{\pi d_p}{N} = \pi m$

Module : $m = \frac{d_p}{N}$

Diametral pitch P: $\frac{m}{25.4} = \frac{1}{P}$

Pitch circle radius: $r = \frac{mN}{2}$

Tooth thickness: $t = \frac{\pi}{2} m$

Addedum: $a = m$

Velocity ratio: $r_v = \frac{W_2}{W_1} = \frac{RPM_2}{RPM_1} = \frac{r_1}{r_2} = \frac{N_1}{N_2}$

Centre distance: $c = \frac{d_{p_1} + d_{p_2}}{2} = \frac{m(N_1 + N_2)}{2} = \frac{N_1 + N_2}{2Pd}$

Base circle radius: $r_b = r_1 \cos\phi$

(r_1: pitch circle radius)

Base pitch: $p_b = m\pi\cos\phi = \frac{\pi}{P}\cos\phi$

Gear chains: $\frac{\text{Target gear}}{\text{Driving gear}} = \frac{\text{Driving gear}}{\text{Driven gear}}$

Planetary gear chains: $\frac{n_T - n_c}{n_D - n_c} = \left(-\frac{N_1}{N_2}\right)\left(-\frac{N_3}{N_4}\right)\cdots$

For gear chains, $-$ for external gear

$+$ for internal gear