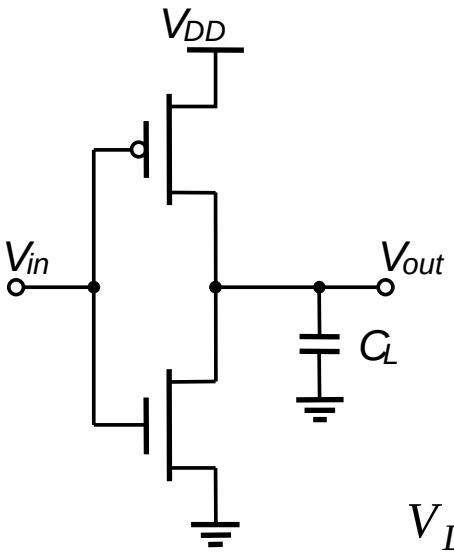
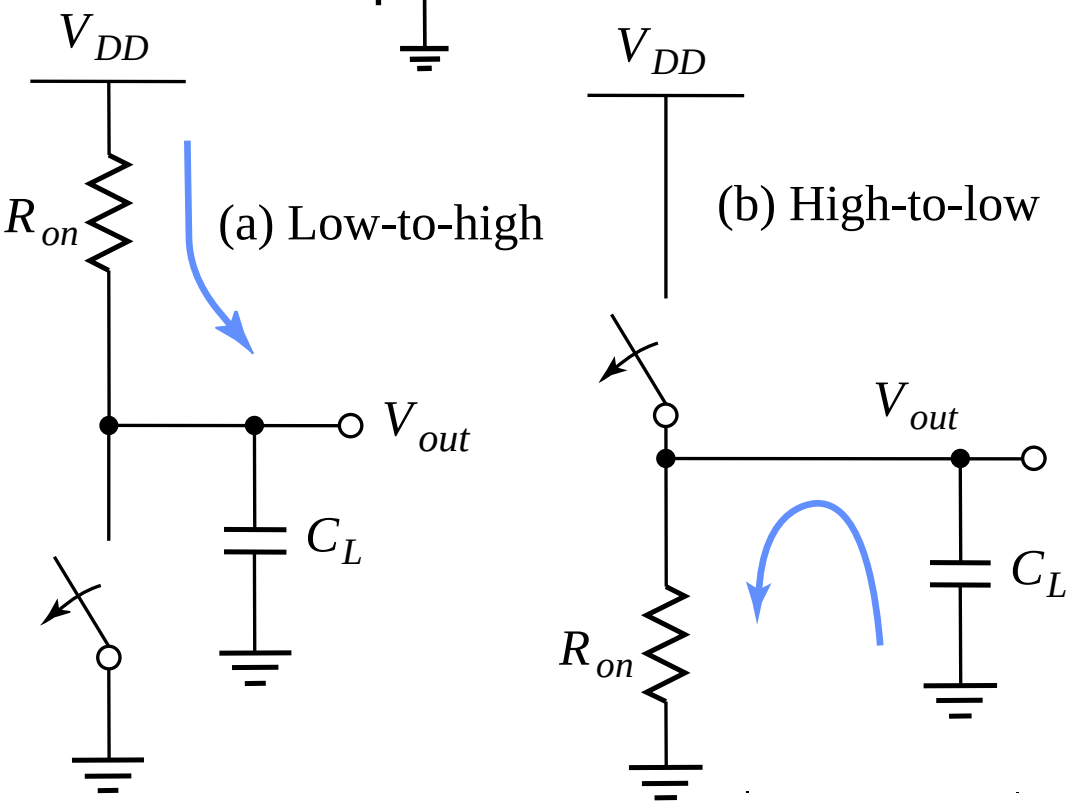
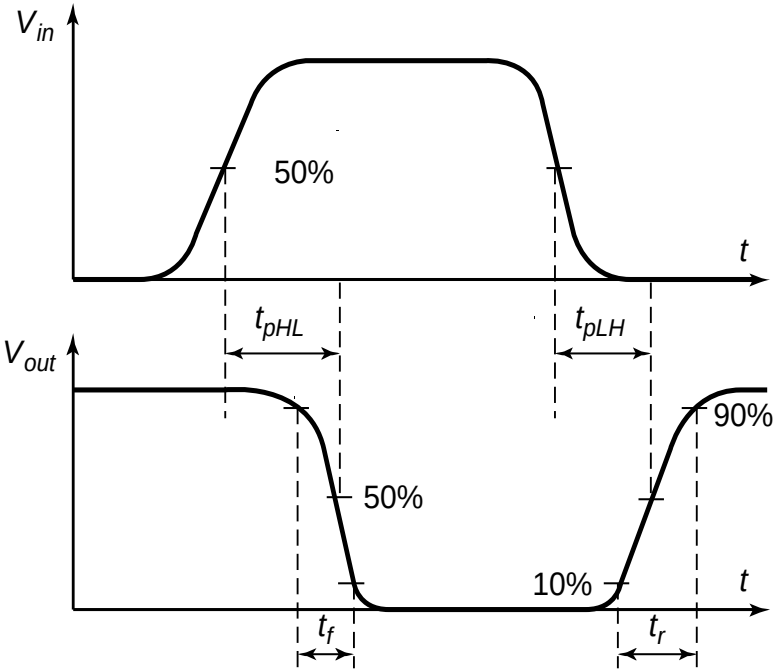
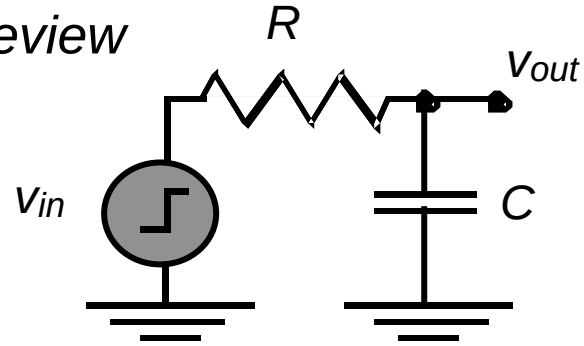
Delay Estimation : Simple RC Networks







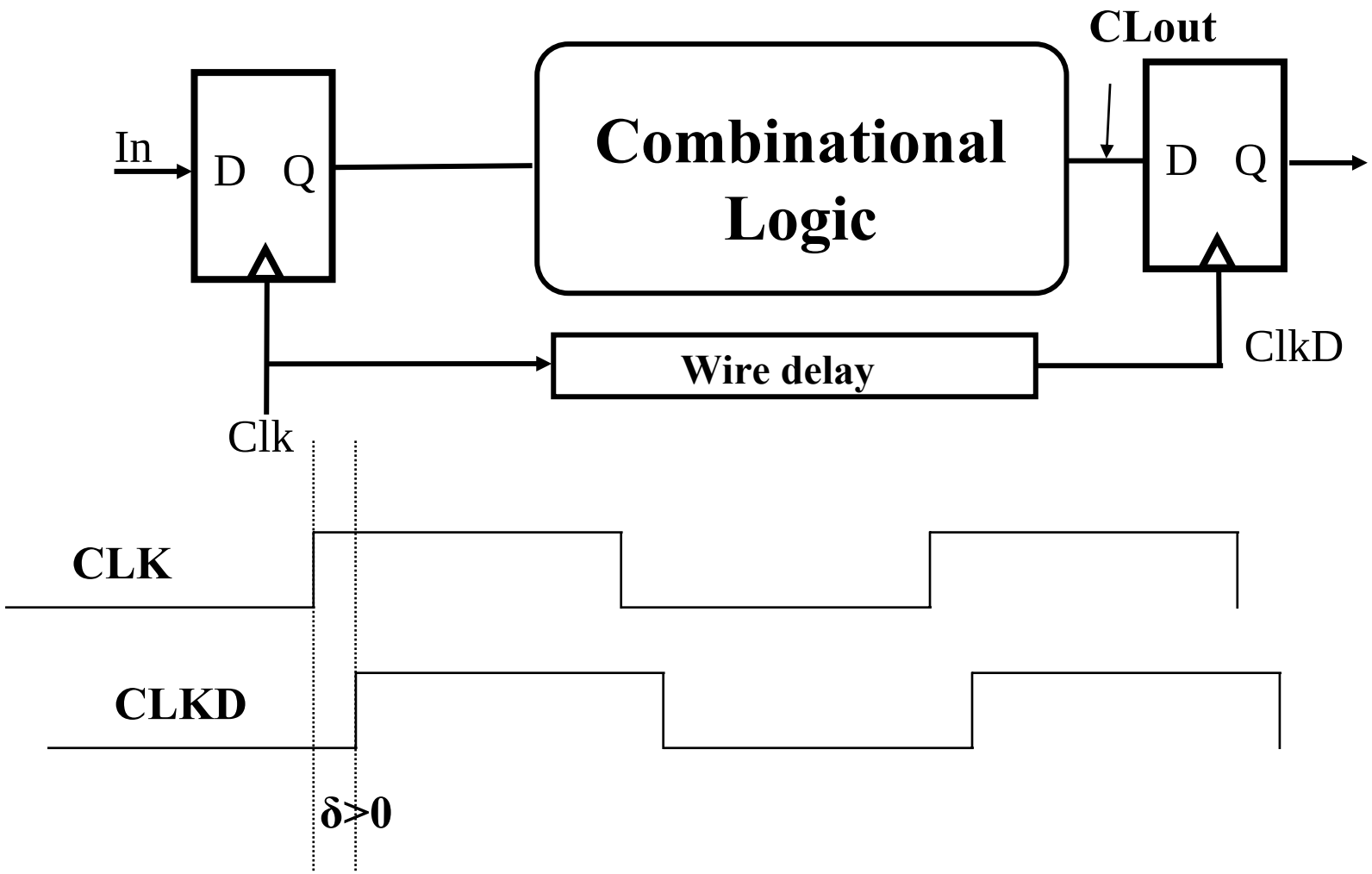
review



$$v_{out}(t) = (1 - e^{-t/\tau})\ V$$

$t_p = \ln(2)\ \tau = 0.69\ RC$

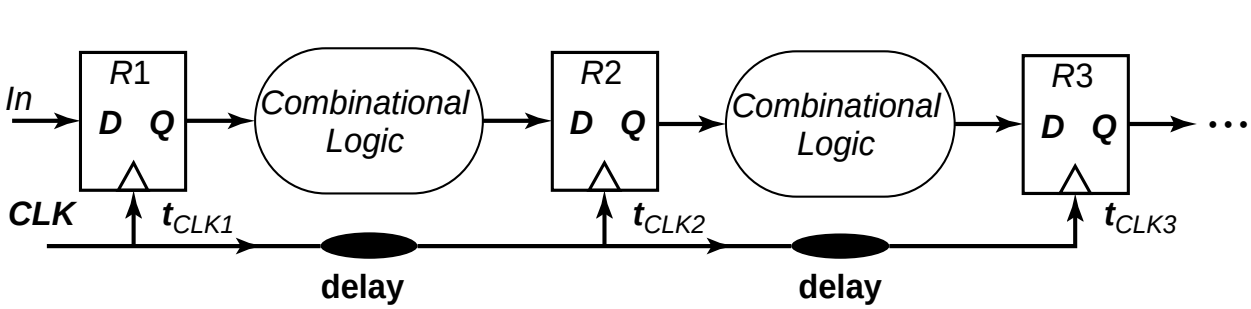
Clocks are Not Perfect: Clock Skew



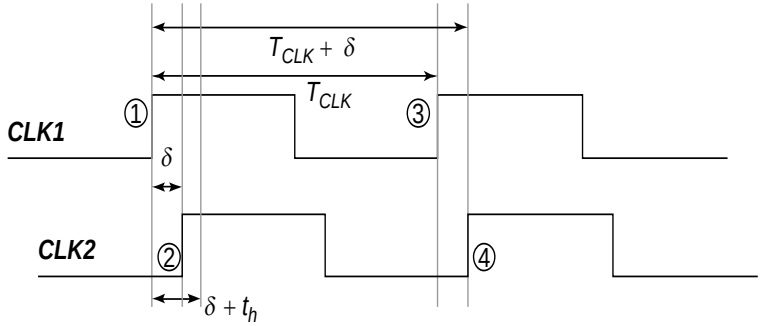
$$T > T_{cq} + T_{logic} + T_{su} - \delta$$

$$T_{cq,cd} + T_{logic,cd} > T_{hold} + \delta$$

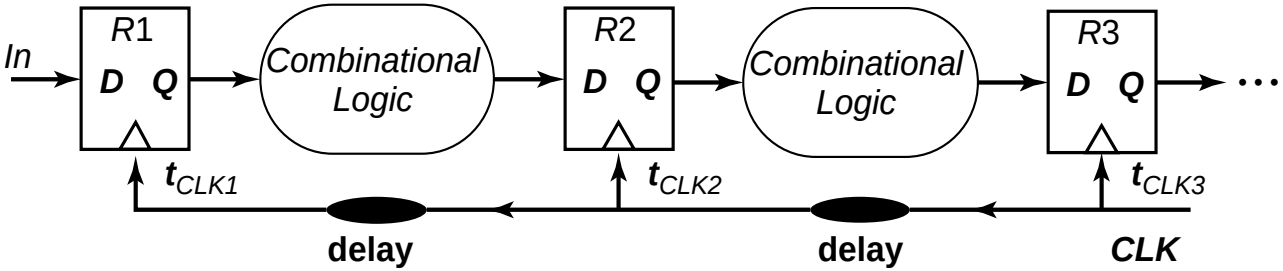
Positive and Negative Skew



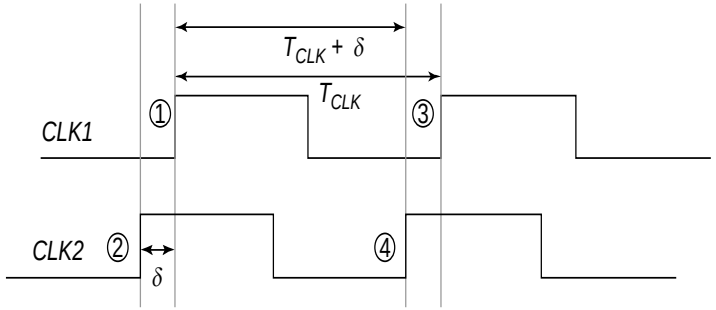
(a) Positive skew



Launching edge arrives before the receiving edge

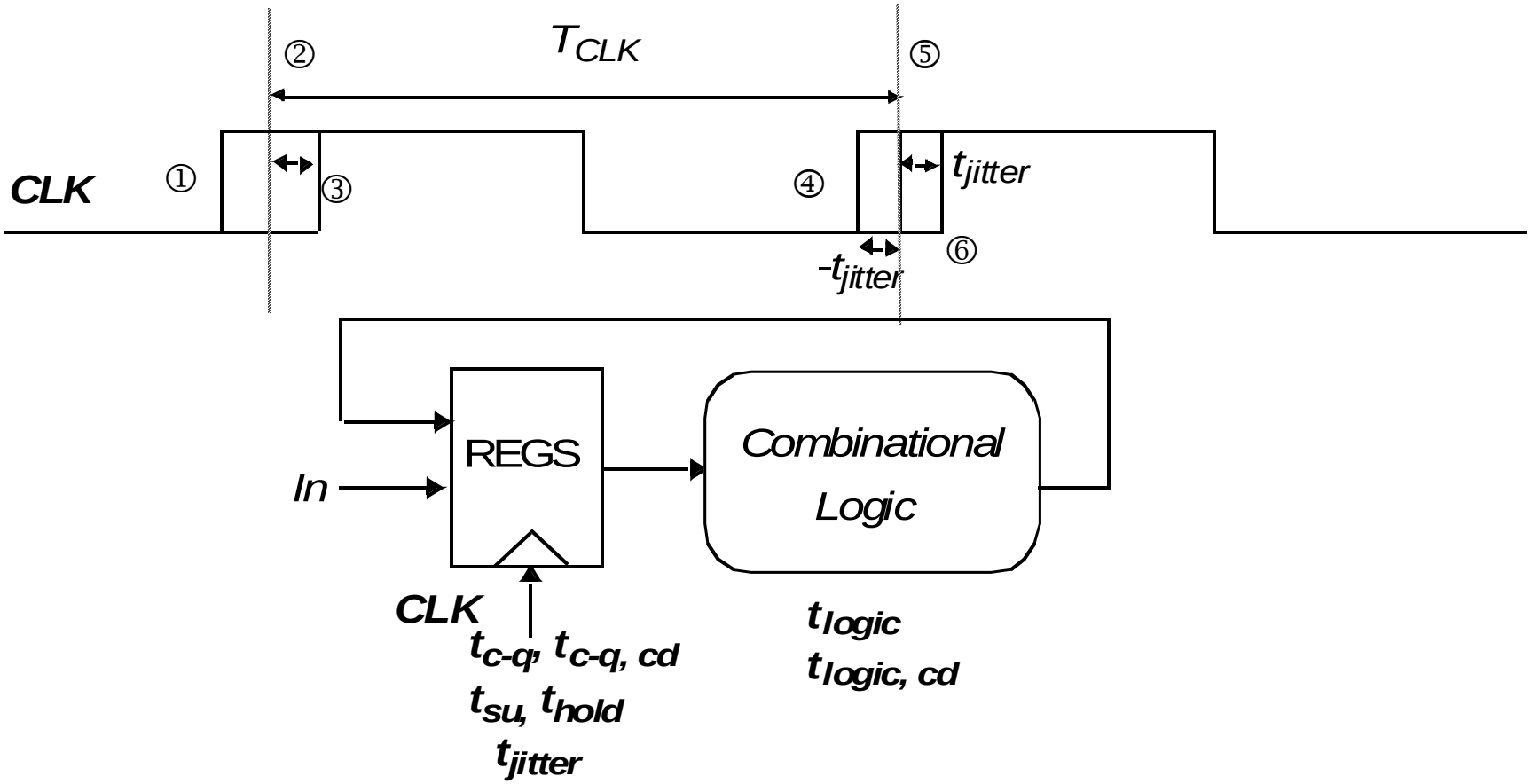


(b) Negative skew



Receiving edge arrives before the launching edge

Clocks are Not Perfect: Clock Jitter



$$T_{CLK} - 2t_{jitter} > t_{c-q} + t_{logic} + t_{su}$$

or

$$T > t_{c-q} + t_{logic} + t_{su} + 2t_{jitter}$$