

Modelling Assumptions

Physics

The simplifications physics makes, and when each one breaks.

Common assumptions and their limits.

Assumption	Breaks when
Point mass	Rotation or size matters
No air resistance	Speed is high or the object is light
Ideal gas	Pressure is high or temperature is low
Small angle, $\sin \theta \approx \theta$	Angle exceeds about 10°
Ohmic conductor	Temperature changes significantly
Inextensible string	Tension is large

Stating your assumptions is not a formality. It defines the range over which your answer can be trusted.