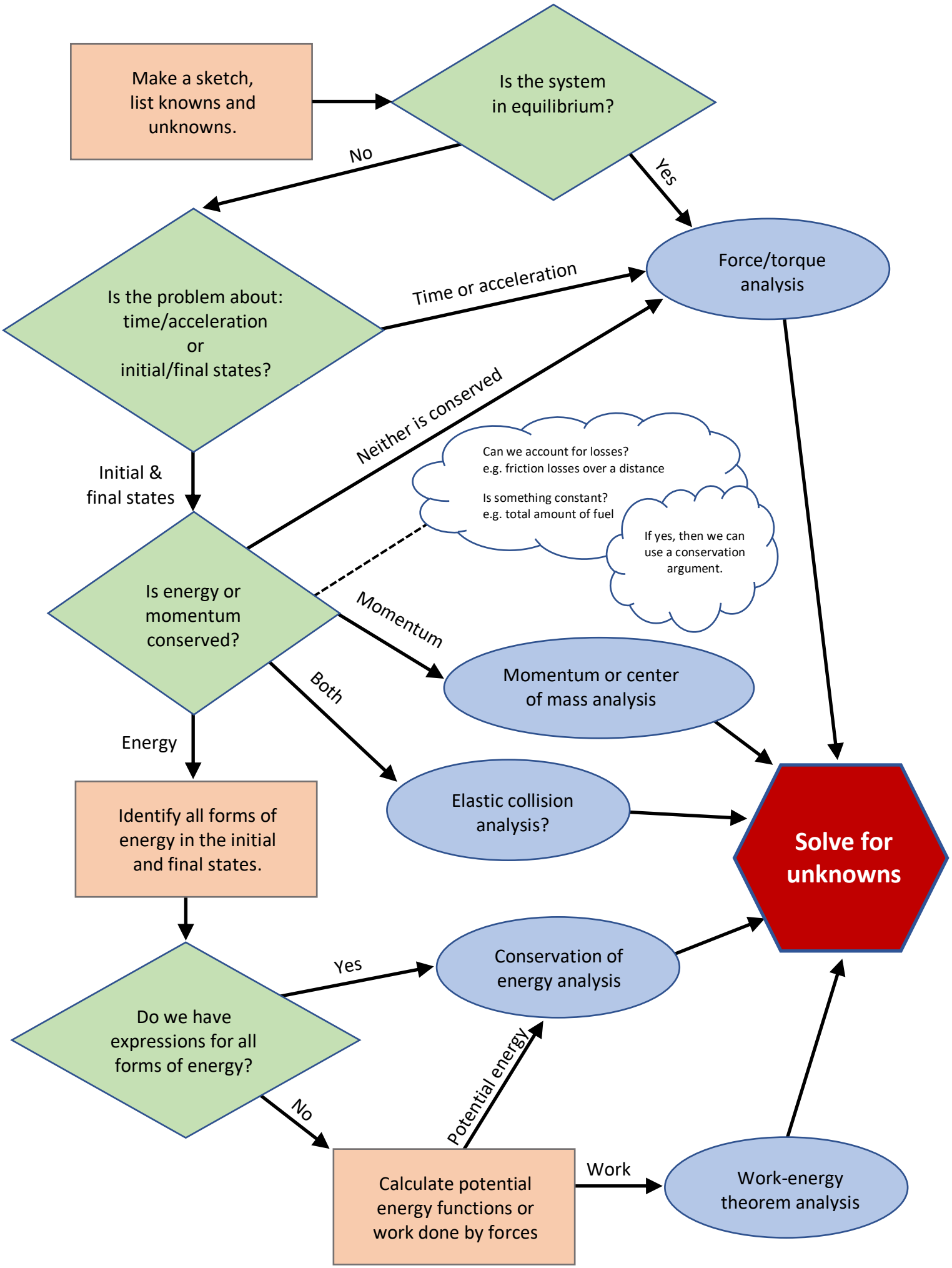
Make a sketch, list knowns and unknowns.
Is the system in equilibrium?
No
Yes
Is the problem about: time/acceleration or initial/final states?
Time or acceleration
Force/torque analysis
Neither is conserved
Initial & final states
Can we account for losses? e.g. friction losses over a distance
Is something constant? e.g. total amount of fuel
If yes, then we can use a conservation argument.
Is energy or momentum conserved?
Momentum
Momentum or center of mass analysis
Both
Energy
Elastic collision analysis?
Solve for unknowns
Identify all forms of energy in the initial and final states.
Yes
Conservation of energy analysis
Do we have expressions for all forms of energy?
Potential energy
No
Calculate potential energy functions or work done by forces
Work
Work-energy theorem analysis