How to Approach Mechanics Questions

- Get an idea for what's going on…
  - What topic is it?… simple-suvat, I & j vectors (zero acceleration or constant acceleration), distance/time/acceleration graphs, simple forces, forces on slopes, boats, pulleys/trains, momentum, projectiles
  - What may be useful here?… draw a graph, write down some information, draw a sketch
  - What are they asking us to find?…
  - What's the critical piece of information given (the thing that the question/answer really depends on)?
  - What am I likely to need to do?…
    - simple-suvat – list down all info given, identify info required, recall suvat equations etc.
    - I & j vectors
      - zero acceleration – speed = distance/time, find velocity per unit time, speed vs velocity
      - constant acceleration – calculate in one dimension then use this result (probably time) to find info in other dimension
    - distance/time/acceleration graphs – differentiate / integrate to find s =, v =, a = . Use info given and these equations to find info required. If more than one motion then draw graphs to help
    - simple forces – in equilibrium or overall (net) force? Find all forces, create equation equating opposite directions, solve.
    - forces on slopes – rotate the sketch, resolve so that all forces are parallel/perpendicular create equation equating opposite directions, solve
    - boats
    - pulleys/trains – create three equations (one each for each side of the pulley, another for whole system), probably simultaneous equations to solve
    - momentum – create equations / find numbers for total momentum before and total momentum after, set equal to each other and solve
    - projectiles – symmetrical or non-symmetrical (is landing height same as thrown height?) horizontal motion has constant velocity, calculate in one dimension then use this result (probably time) to find info in other dimension, break motion down into smaller parts if required.
- Do some calculations, arithmetic, algebra…
- Look back at question to check you've done as required