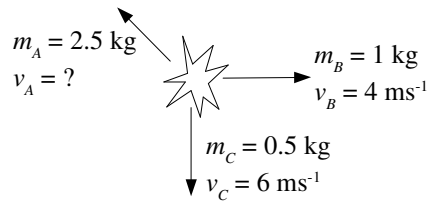


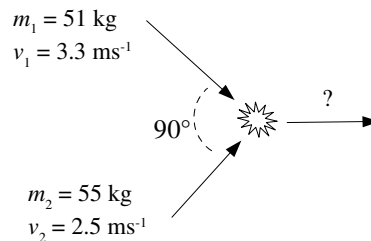
Year 11 Physics Assignment  
Work, Energy and Momentum 2

1. An astronaut (mass 90 kg) is standing on the outside of a stationary spacecraft (of mass 1600 kg). If the astronaut pushes off from the spacecraft with a force of 150N for 1.02 seconds:
- Calculate the final momentum of the astronaut /3
  - State the final momentum of the spacecraft /1
  - Calculate the final speed of the astronaut /2
  - Calculate the final speed of the spacecraft /2
2. Calculate the change in total kinetic energy for questions 4 and 5 in assignment 1 and conclude which (if any) are elastic collisions. /5

3. An explosive with no initial speed breaks apart as shown below (B and C leave at right angles to each other). Determine the speed of fragment A. /3



4. For a laugh, two foolish young boys cover themselves with glue and then run into each other at  $90^\circ$ . Determine the speed of the boys once they are stuck together. /3



TOTAL /19