

YEAR 09

Physics Homework

Revision on Speed, Force and Motion

(Note: for every answer you need to show your calculations)

1. A jet has a top speed of 1500 km/h.
 - a. The pilot boasts that he can fly at 410 m/s. Is he telling the truth?
 - b. Darlington is 470 miles north-east of Farnborough. It takes 40 minutes for the pilot to fly to Darlington in a straight line from Farnborough. Work out this velocity in km/h. (1 mile = 1609 m)
 - c. After re-fueling the pilot leaves Darlington and flies south at top speed for 535 km then due west back to Farnborough for 535 km at 1000 km/h. How long does his return journey take?
 - d. Was the journey to Farnborough faster than the journey to Darlington?
2. Use $F = ma$ to answer the following question.
 - a. A child on a skate board is accelerating at 2.95 m/s^2 with a resultant force of 138 N. What is the child's mass to the nearest kilogram if the skateboard has a mass of 1.4 kg?
 - b. In a cheese-rolling competition the heaviest cheese has a mass of 14 kg. Find the resultant force on the cheese if it accelerates at 4.2 m/s^2 .
 - c. The maximum resultant force a fish can generate when swimming is 38 N. What will its maximum acceleration be if the fish has a mass of 7 kg?
 - d. A thief is pulling a woman's bag with a force of 29 N. The woman is trying to get her bag back with a pull in the opposite direction of 18.5 N. What is the mass of the bag if it constantly accelerates at 1.6 m/s^2 ? Is the bag accelerating towards the woman or the thief?