

PS 3.5, Due Thursday, April 26 in class

2. Dragsters have a mass of about 1000 kg and the best dragsters get to 44 m/s in about 0.8 s.
  - a) What's the acceleration?
  - b) Estimate the coefficient of friction necessary to make this happen if you were in a regular car on flat ground.
  - c) What's the average power output during this 0.8 s?
  - d) Dragsters have their exhaust pipes pointed *upwards*, which ejects a huge amount of exhaust straight up into the air at very high velocity. What effect does this thrust have on the ability of the car to accelerate? *Why? Please start with clarification of reasons, drawings, lenses.*  
According to my calculations, the engines kick out about 18 kg of exhaust every second at about 230 m/s.
  - e) What is the momentum of this amount of gas?
  - f) How much force should this put on the vehicle? In which direction?
  - g) With this extra "downforce", what coefficient of friction is necessary in order to accelerate the dragster?