Air resistance – Practice

density of air = 1.2 kg/m^3

1. This question is about the drag force on two different cars.

	
Toyota Camry frontal area = 0.70 m^2 drag coefficient = 0.27	Hummer H2 frontal area = 2.44 m^2 drag coefficient = 0.57.

(a) Calculate the drag force on each car, travelling at 50 km/hr. *(22N, 161N)*

(b) Calculate the factor by which the drag force on either car increases when the speed increases to 110 km/hr. *(4.8)*

2. A man, mass 70 kg, does a parachute jump. His parachute has mass 5 kg and, when deployed, is of a circular cross-section with radius 4.0 m.
drag coefficient = 0.8

Calculate the steady speed at which he descends. *(5.5 m/s)*

3. A 75 kg skydiver has an area of 0.33 m^2 and reaches a terminal velocity of 60 m/s.
density of air = 1.2kg/m^3
Calculate the drag coefficient. *(1.03)*

4. The drag coefficient of a car at the design conditions of 1 atmosphere pressure, 25°C, and 90 km/h is measured experimentally in a wind tunnel.

The height of the car is 1.40 m,
The width of the car is 1.65 m.
The horizontal force acting on the car is 300 N.
density of air = 1.164 kg/m^3 (at 1 atmosphere and 25°C)

Calculate the drag coefficient of this car. *(0.36)*