3 Some quantities are vectors, others are scalars.

(a) Complete the table ticking the boxes to show which quantities are vectors and which are scalars.

One has been done for you.

(2)

Quantity	Vector	Scalar
distance		
force		
momentum	✓	
speed		
velocity		

(b) A car travels at 20 m/s.

The mass of the car is 1500 kg.

(i) State the equation linking momentum, mass and velocity.

(1)

(ii) Calculate the momentum of the car.

(2)

momentum = ... kg m/s

(c) In a crash test, a car runs into a wall and stops.

(Author: Brady Holt, 2010)

The momentum of the car before the crash is 22 500 kg m/s.

The car stops in 0.14 s.

(i) Calculate the average force on the car during the crash.

(2)

average force = ... N

(ii) Use ideas about momentum to explain how seat belts can reduce injuries to passengers during a crash.

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 3 = 10 marks)