10 A force F is applied to a freely moving object. At one instant of time, the object has velocity v and acceleration a.

Which quantities **must** be in the same direction?

A a and v only

B a and F only

C v and F only

D v, F and a

11 The momentum of an object changes from $160\,\text{kg m s}^{-1}$ to $240\,\text{kg m s}^{-1}$ in 2 s.

What is the mean resultant force on the object during the change?

A 40 N **B** 80 N **C** 200 N **D** 400 N

12 A car accelerates in a straight line.

A graph of the momentum of the car is plotted against time.

What is evaluated by finding the gradient of the graph at a particular time?

A the acceleration of the car

B the resultant force on the car

C the kinetic energy of the car

D the power supplied to the car

Space for working