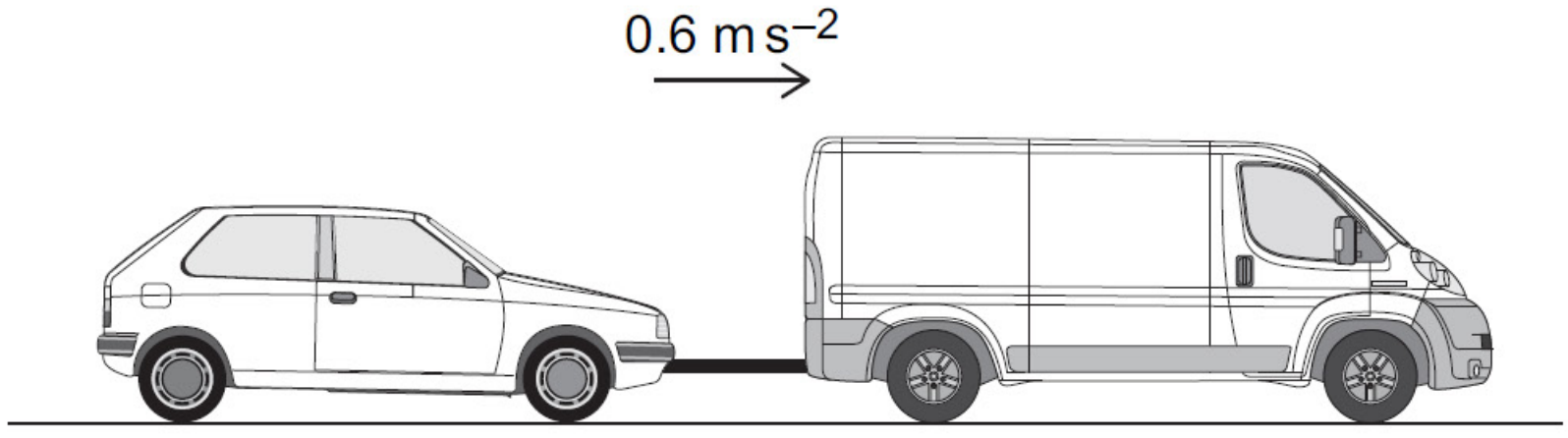
**18** A rescue van is towing a broken-down car by using a tow bar.

The van and the car are moving with a constant acceleration of $0.6\,\text{m}\,\text{s}^{-2}$ along a straight horizontal road as shown in the diagram below.




The van has a total mass of 2780 kg

The car has a total mass of 1620 kg

The van experiences a driving force of $D$ newtons.

The van experiences a total resistance force of $R$ newtons.

The car experiences a total resistance force of $0.6R$ newtons.

**18 (a)** The tension in the tow bar, $T$ newtons, may be modelled by

$$T = kD - 18$$

where $k$ is a constant.

Find $k$

**[5 marks]**

**18 (b)** State one assumption that must be made in answering part **(a)**.

**[1 mark]**