

20. We apply Eq. 9-22 ( $p = mv$ ) and Eq. 7-1 ( $K = \frac{1}{2}mv^2$ ).

(a) The speed of the VW Beetle of mass  $m$  is

$$v = \frac{p}{m} = \frac{(2650 \text{ kg})(16 \text{ km/h})}{816 \text{ kg}} = 52 \text{ km/h} .$$

(b) In this case, the speed of the VW Beetle must be

$$v = \sqrt{\frac{2K}{m}} = \sqrt{\frac{2(2650 \text{ kg})(16 \text{ km/h})^2/2}{816 \text{ kg}}} = 29 \text{ km/h} .$$