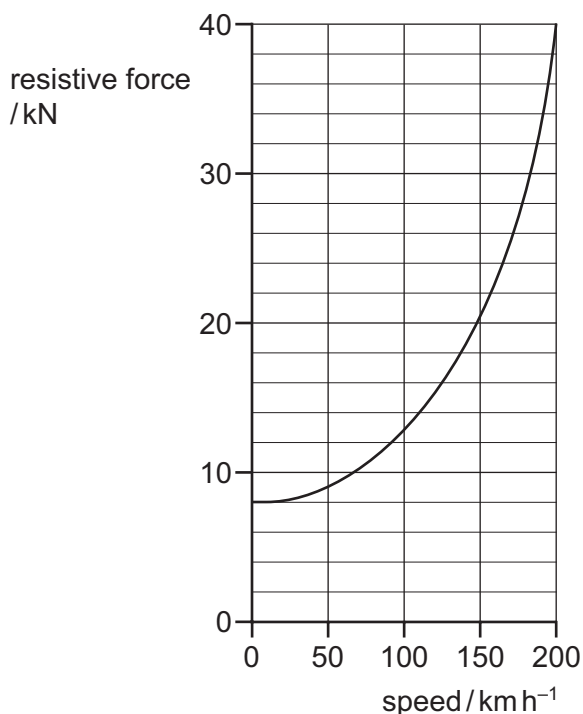


- 16** The graph shows how the total resistive force acting on a train varies with its speed.

Part of this force is due to wheel friction, which is constant. The rest is due to wind resistance.



What is the ratio  $\frac{\text{wind resistance}}{\text{wheel friction}}$  at a speed of 200 km h<sup>-1</sup>?

- A** 4                      **B** 5                      **C** 8                      **D** 10

- 17** The pump of a water pumping system uses 2.0 kW of electrical power when raising water. The pumping system lifts 16 kg of water per second through a vertical height of 7.0 m.

What is the efficiency of the pumping system?

- A** 1.8%                      **B** 5.6%                      **C** 22%                      **D** 55%

- 18** A body travelling with a speed of 20 m s<sup>-1</sup> has kinetic energy  $E_k$ .

If the speed of the body is increased to 80 m s<sup>-1</sup>, what is its new kinetic energy?

- A**  $4E_k$                       **B**  $8E_k$                       **C**  $12E_k$                       **D**  $16E_k$

**Space for working**