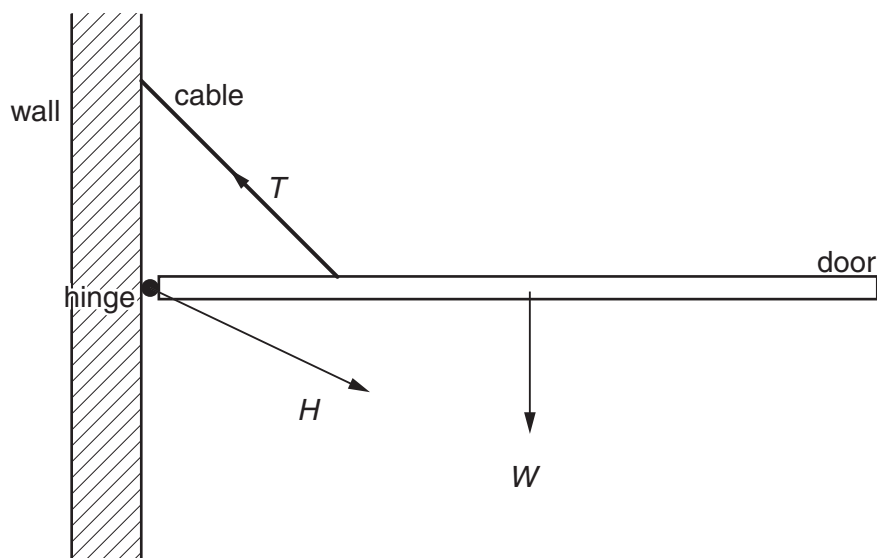


- 15 A force  $F$  is applied to a freely moving object. At one instant of time, the object has velocity  $v$  and acceleration  $a$ .

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  $a$
- 16 A hinged door is held closed in the horizontal position by a cable.
- Three forces act on the door: the weight  $W$  of the door, the tension  $T$  in the cable, and the force  $H$  at the hinge.



Which list gives the three forces in **increasing** order of magnitude?

- A  $H, T, W$       B  $T, H, W$       C  $W, H, T$       D  $W, T, H$
- 17 A mass is raised vertically. In time  $t$ , the increase in its gravitational potential energy is  $E_p$  and the increase in its kinetic energy is  $E_k$ .

What is the average power input to the mass?

- A  $(E_p - E_k)t$   
B  $(E_p + E_k)t$   
C  $\frac{E_p - E_k}{t}$   
D  $\frac{E_p + E_k}{t}$