

**8** A particle  $P$  projected from a point  $O$  on horizontal ground hits the ground after 2.4 seconds.

The horizontal component of the initial velocity of  $P$  is  $\frac{5}{3}d \text{ ms}^{-1}$ .

**(a)** Find, in terms of  $d$ , the horizontal distance of  $P$  from  $O$  when it hits the ground. **[1]**

**(b)** Find the vertical component of the initial velocity of  $P$ . **[2]**

$P$  just clears a vertical wall which is situated at a horizontal distance  $d$  m from  $O$ .

**(c)** Find the height of the wall. **[3]**

The speed of  $P$  as it passes over the wall is  $16 \text{ ms}^{-1}$ .

**(d)** Find the value of  $d$  correct to 3 significant figures. **[4]**