A particle P of mass m kg moves along a horizontal straight line with acceleration $a\,\mathrm{m\,s^{-2}}$ given by

$$a = \frac{v(1-2t^2)}{t},$$

where $v\,\mathrm{m\,s^{-1}}$ is the velocity of P at time t s.

(a) Find an expression for v in terms of t and an arbitrary constant. [3]

(b) Given that $a = 5$ when $t = 1$, find an expression, in terms of m and t, for the horizontal force acting on P at time t. [3]