A particle P moves in a straight line through a point O. The velocity $v\,\mathrm{m\,s^{-1}}$ of P, at time $t\,\mathrm{s}$ after passing O, is given by

$$v = \frac{9}{4} + \frac{b}{(t+1)^2} - ct^2,$$

where b and c are positive constants. At $t = 5$, the velocity of P is zero and its acceleration is $-\frac{13}{12}\,\mathrm{m\,s^{-2}}$.

(a) Show that $b = 9$ and find the value of c. [5]

(b) Given that the velocity of P is zero only at $t = 5$, find the distance travelled in the first 10 seconds of motion. [5]