

Solutions

1a.

$\mathbf{r} = \mathbf{ut} + \frac{1}{2} \mathbf{at}^2$	M1
$(7\mathbf{i} - 10\mathbf{j}) = 2(2\mathbf{i} - 3\mathbf{j}) + \frac{1}{2} \mathbf{a}2^2$	M1
$\mathbf{a} = (1.5\mathbf{i} - 2\mathbf{j})$	M1
$a = \sqrt{1.5^2 + (-2)^2} = 2.5\text{ms}^{-2}$	M1

1b.

$\mathbf{v} = \mathbf{u} + \mathbf{at}$	M1
$\mathbf{v} = (2\mathbf{i} - 3\mathbf{j}) + 2(1.5\mathbf{i} - 2\mathbf{j})$ $\mathbf{v} = (5\mathbf{i} - 7\mathbf{j})$	M1
$\mathbf{v} = (5\mathbf{i} - 7\mathbf{j}) + t(4\mathbf{i} + 8.8\mathbf{j})$ $= (5 + 4t)\mathbf{i} + (8.8t - 7)\mathbf{j}$ $(5 + 4t) = (8.8t - 7)$	M1
$t = 2.5 \text{ s}$	M1

