Question	Scheme	Marks	AOs
4(a)	Attempts to compare the two position vectors. Allow an attempt using two of $\overrightarrow{AO}, \overrightarrow{OB}$ or $\overrightarrow{AB}$ E.g. $(-24\mathbf{i}-10\mathbf{j})=-2\times(12\mathbf{i}+5\mathbf{j})$	M1	1.1b
	Explains that as $\overrightarrow{AO}$ is parallel to $\overrightarrow{OB}$ (and the stone is travelling in a straight line) the stone passes through the point *O*.	A1	2.4
		(2)	
(b)	Attempts distance $AB = \sqrt{(12+24)^2+(10+5)^2}$	M1	1.1b
	Attempts speed = $\dfrac{\sqrt{(12+24)^2+(10+5)^2}}{4}$	dM1	3.1a
	Speed = $9.75\,\text{ms}^{-1}$	A1	3.2a
		(3)	
			(5 marks)
Alt(a)	Attempts to find the equation of the line which passes through *A* and *B* E.g. $y-5=\dfrac{5+10}{12+24}(x-12)$ $\quad(y=\dfrac{5}{12}x)$	M1	1.1b
	Shows that when $x=0,\ y=0$ and concludes the stone passes through the point *O*.	A1	2.4

Notes

(a)

M1: Attempts to compare the two position vectors. Allow an attempt using two of $\overrightarrow{AO}, \overrightarrow{OB}$ or $\overrightarrow{AB}$ either way around.
E.g. States that $(-24\mathbf{i}-10\mathbf{j})=-2\times(12\mathbf{i}+5\mathbf{j})$
Alternatively, allow an attempt finding the gradient using any two of *AO*, *OB* or *AB*

Alternatively attempts to find the equation of the line through *A* and *B* proceeding as far as $y=...x$ Condone sign slips.

A1: States that as $\overrightarrow{AO}$ is parallel to $\overrightarrow{OB}$ or as *AO* is parallel to *OB* (and the stone is travelling in a straight line) the stone passes through the point *O*. Alternatively, shows that the point $(0,0)$ is on the line and concludes (the stone) passes through the point *O*.

(b)

M1: Attempts to find the distance *AB* using a correct method.
Condone slips but expect to see an attempt at $\sqrt{a^2+b^2}$ where *a* or *b* is correct

dM1: Dependent upon the previous mark. Look for an attempt at $\dfrac{\text{distance } AB}{4}$

A1: $9.75\,\text{ms}^{-1}$ Requires units