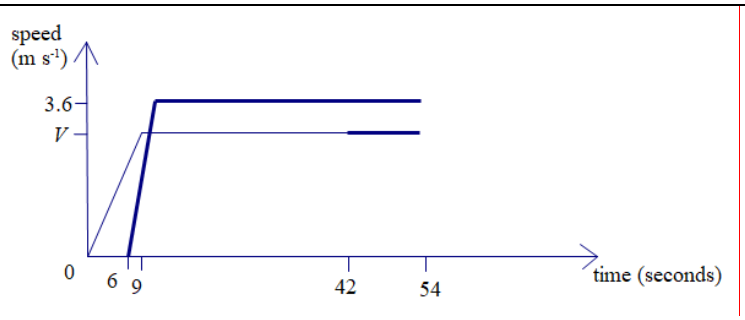
Q	Scheme	Marks	Notes
4a	Correct method to form an equation in V only using either area = distance travelled or *suvat*.	M1	Condone confusion over units for time.
	$120=\frac{1}{2}(42+33)\times V$ **OR** $\frac{1}{2}\times 9V+33V=120$ **OR** $42V-\frac{1}{2}\times 9V=120$	A1	Correct unsimplified equation in V only.
	$V = 3.2$ *	A1*	Obtain given answer from correct working Allow *v*. **N.B.** A correct equation is required but NO intermediate line(s) of working.
		[3]	
4b	$a=\frac{3.2}{9}$	M1	Correct method
	$=\frac{16}{45}=0.3555...=0.36$ or better (ms^{-2})	A1	cao
		[2]	
4c		B1	Correct shape for *Q*. Allow crossing before $t = 9$ and ignore gradients but horizontal line must be above the *P* graph. B0 if it starts at the origin.
		DB1	3.6 and 6 marked
		B1	Correct shape for *P* (line extended) and both ending at $t = 54$ (or equiv) marked
	N.B. Allow dotted vertical lines but withhold the first B1 if any continuous vertical lines.		
		[3]	

4d	Dist. travelled by $P = 120 + (12 \times 3.2)$ **OR** $\frac{1}{2}(54+45)\times 3.2$ **OR** $\frac{3.2\times 9}{2} + (45\times 3.2)$	B1	Seen, or implied by 158.4 used
	Distance travelled by Q: Clear attempt to use area or *suvat* to form an expression in T only. Must be attempting to use 54 i.e **extended** graph, with correct structure (i.e. triangle + rectangle or trapezium)	M1	Any complete method.
	$\frac{\left(48+\left(48-T\right)\right)}{2}\times 3.6$ **OR** $\frac{1}{2}\times T\times 3.6 + \left(48-T\right)\times 3.6$	A1	Correct unsimplified expression in T only.
	$\frac{\left(48+\left(48-T\right)\right)}{2}\times 3.6 = 158.4$ ($= \frac{1}{2}(54+45)\times 3.2$)	**D**M1	Dependent on previous M mark,form and solve an equation in T only using **total** distances.
	$T = 8$	A1	Correct only
		[5]	
		(13)	