

3	$\left[\begin{array}{c} 20\\ 18\\ 16\\ 14\\ 12\\ 10\\ 10\\ 0\\ 0\\ 0\\ 20\\ 0\\ 0\\ 0\\ 20\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0$	 [1] Correct acceleration [1] Correct deceleration [1] Correct constant speeds [1] Complete graph
4(a)	She calculated average acceleration	[1] Valid comment
	Her actual acceleration is not constant	[1] Valid comment
4(b)	Average acceleration	[1] Valid comment
4(c)	Diane's estimate is incorrect because the flat line between 14: 00 and 14: 30 is representing a constant velocity, and not a pause. This needs to be included.	[1] Valid comment
	$22 + \frac{20}{2} = 32$	[1] Actual distance covered
4(d)	Overestimate	[1] Correct statement
	More of the curve is below the line used for the estimate	[1] Valid reason
4(e)	Use multiple trapezia or triangles	[1] Valid improvement to approach
5(a)	$\left(\frac{1}{2} \times 1.5 \times 4.5 \times 60\right) + \left(\frac{1}{2} \times (4.5+2) \times 2.5 \times 60\right) =$	[1] Division of graph into triangles
	= 690 m	[1] Area under graph
5(b)	Underestimate as more of the curve is above the line used for the estimate	[1] Dependant on how the graph has been drawn will be
6(a)	Travel in other direction	[1] Correct interpretation
6(b)	$A: \frac{1}{2}\left(\frac{1}{2} + 4.5\right) \times 18 = 45$ miles	[1] Area calculation
	$B: \frac{1}{2}\left(\frac{1}{2} + 2.5\right) \times 12 = 18$ miles	[1] Area calculation
	18 + 45 = 63 miles	[1] Total area
6(c)	It will be shorter due to travel in other direction	[1] Correct interpretation

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