

Question Number	Scheme	Marks
4(a)	<p>Detailed description: The graph consists of two trapezoids sharing a common vertical axis. The horizontal axis is marked with 0, T, and 25. The first trapezoid is bounded by the vertical axis from 0 to T, and a horizontal line at height 30 from t=0 to t=T. Its total area is given as 40. The second trapezoid starts at height 30 at t=T, reaches a peak of 40 at t=25, and then decreases linearly to 25 at t=25. The total area under both trapezoids is given as 975.</p>	B1 shape (<i>M</i>) B1 figs (40, <i>T</i>) B1 shape (<i>N</i>) B1 figs (30, 25) (4)
(b)	<p>For N: $\frac{1}{2}(25 + 25 + t).30 = 975$ OR $\frac{1}{2}(25 + t_1).30 = 975$ $t = 15$ $t_1 = 40$</p> <p>For M: $\frac{1}{2}(25 + t + T).40 = 975$ OR $\frac{1}{2}(t_1 + T).40 = 975$ $T = 8.75$ ($8\frac{3}{4}$ or $\frac{35}{4}$ oe)</p>	M1 A1 DM1 A1 M1 A1 DM1 A1 (8) 12
ALTERNATIVE: They may find t or t_1 , in terms of T , from their (<i>M</i>) equation , and substitute for t or t_1 in their (<i>N</i>) equation, and then solve for T :		
<p>For M: $\frac{1}{2}(25 + t + T).40 = 975$ OR $\frac{1}{2}(t_1 + T).40 = 975$ $t = (\frac{1950}{40} - 25 - T)$ $t_1 = (\frac{1950}{40} - T)$</p> <p>For N: $\frac{1}{2}(25 + 25 + t).30 = 975$ OR $\frac{1}{2}(25 + t_1).30 = 975$ sub for t or sub for t_1 $T = 8.75$ ($8\frac{3}{4}$ or $\frac{35}{4}$ oe)</p>		M1 A1 DM1 A1 M1 A1 DM1 A1 (8) 12
Notes		
4(a)	First B1 (<i>M</i>) for correct shape – <i>must start and finish on the axes</i> . Second B1 for 40 and <i>T</i> marked clearly (if delineators omitted B0) and correctly Third B1 (<i>N</i>) for correct shape – <i>must start and finish on the axes</i> . Fourth B1 for 30 and 25 (if delineators omitted B0) marked clearly and correctly N.B. If graphs do not cross and/or do not finish at the same point, max score is B1B1B0B1.	