Mark scheme

Speed-time graphs

Mathematics 0580 · Questions from Paper 2 and Paper 4

Total marks

46

MARKS FOR EACH QUESTION

1	2	3	4	5	6	7	8	9	10	Total
2	2	3	4	4	5	6	5	7	8	**46**

Question 1 [2]

1	90	**2**	**M1** for a correct area calculation e.g. 8×10 or $0.5 \times 2 \times 10$ or better

Question 2 [2]

2	Diagonal line from (0, 0) to (30, 12)	**1**	
	and Horizontal line from (30, 12) to (70, 12)	**1FT**	**FT** for horizontal line from (30, *k*) to (70, *k*) where *k* is *their* 12

Question 3 [3]

3	Straight line from (20, 14) to (35, 14) and straight line from (35, 14) to (45, 0)	**3**	**M1** for $210 \div 14$ soi **M1** for $14 \div 1.4$ or any line with gradient –1.4 ending at *x* axis

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Question 4 [4]

4(a)	$1\frac{2}{3}$ or 1.67 or 1.666 to 1.667	**1**	
4(b)	1062.5	**3**	**M2** for $\frac{25}{2}(50+35)$ oe or **M1** for one area

Question 5 [4]

5	**(a)**	5	**3**	**M2** for $\frac{u\times 10}{2}+2u\times 10=125$ oe or **M1** for evidence that area represents distance e.g. $\frac{u\times 10}{2}$, $2u\times 10$ or $3u\times 10$
	(b)	2	**1FT**	**FT** 10 ÷ *their u* correctly evaluated

Question 6 [5]

6	**(a)** 0.133 (3…) or $\frac{2}{15}$	**2**	**M1** for 40 ÷ 300 seen
	(b) $33\frac{1}{3}$ or 33.3	**3**	**M1** for area under graph attempted **M1** for correct total area statement

Question 7 [6]

7	**(a)** 480	**1**	
	(b) 9900	**3**	**M1** for attempt at area under graph **M1** for 0.5 × 15 × (their **(a)** + 14 × 60) oe or 0.5 × 15 × (8 + 14) oe
	(c) 0.125 or $\frac{1}{8}$	**2**	**M1** for numerical vertical/horizontal or numerical use of v = u + at but t ≤ 120 or t ≤ 2

Question 8 [5]

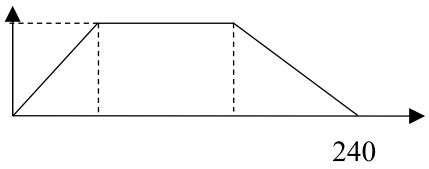
8	$16\frac{1}{4}$ or 16.3	5	**M1** finding the area under graph **A1** 130 **M1** $\frac{1}{2}\times 16\times v$ **M1** equating and solving

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Question 9 **[7]**

9(a)	0.6	**1**	
9(b)	50.7	**3**	**M2** for $1.2 \times 19 + \frac{1}{2}(19 + 12) \times 1.8$ oe or **M1** for method for finding any relevant area
9(c)	17.9	**3**	**M2** for *their* $50.7 - 1.2 \times 19$ [– 10] oe or **M1** for 1.2×19 oe seen isw

Question 10 **[8]**

10(a)	0.18 or $\frac{9}{50}$	**1**	
10(b)	$1944 \times \frac{1000}{3600 \times 3600}$	**M1**	
	$9 \div 0.15 = 60$	**M1**	
10(c)		**1**	ruled line to axis with point of contact at 240
10(d)	6.9375	**4**	**M2** for area = $\frac{1}{2} \times (130 + 240) \times 9$ oe or **M1** for one correct partial area **M1dep** for *their* total area ÷ 240

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