1(a)	15 × 24 or 360 and 40 × 76 or 3040 and 55 × 52 or 2860 and 75 × 48 or 3600 or 9860	M1	allow one incorrect midpoint
	(their 360 + their 3040 + their 2860 + their 3600) ÷ 200 or 9860 ÷ 200	M1dep	condone bracket error seen eg 360 + 3040 + 2860 + 3600 ÷ 200
	49.3	A1	accept 49 if full working shown using correct midpoints

Additional Guidance	
Four values or products with three correct from 360, 3040, 2860 and 3600 implies the first mark and could be used to score up to M2	
Correct products seen in the table or working but a different method shown in the working lines eg 200 ÷ 4	M0
Ignore attempts to convert to minutes and seconds after 49.3 seen eg 49 min 18 s or 49 min 30 s	
49.3 in working with answer $30 \leqslant t < 50$	M2A0

1(b)	24 ÷ 30 or 0.8 or 76 ÷ 20 or 3.8 or 52 ÷ 10 or 5.2 or 48 ÷ 30 or 1.6 or four frequency densities in correct proportion	M1	implied by a correct bar eg 8 and 38 and 52 and 16
	At least three of 0.8 and 3.8 and 5.2 and 1.6	M1dep	implied by at least three bars in correct proportion
	At least 3 bars in correct proportion with matching scale on vertical axis or at least 3 bars in correct proportion with a matching key	M1dep	
	Fully correct histogram with scale on vertical axis or a key	A1	$\pm \dfrac{1}{2}$ small square ignore frequency polygon if included

Additional Guidance	
Allow up to M2 even if not subsequently used	
Correct bars must have correct widths	

Q	Answer	Mark	Comments
2	(Class widths are) 5, 5, 10, 30	M1	
	18 ÷ 5 or 3.6 or 23 ÷ 5 or 4.6 or 17 ÷ 10 or 1.7 or 21 ÷ 30 or 0.7	M1	implied by correct bar
	Any three of 18 ÷ 5 or 3.6 and 23 ÷ 5 or 4.6 and 17 ÷ 10 or 1.7 and 21 ÷ 30 or 0.7	M1dep	implied by correct bars
	All bars correct	A1	$\pm \dfrac{1}{2}$ square

Additional Guidance	
Four correct frequency density values imply first M1	

Q	Answer	Mark	Comments
	0.6×10 or 6 or 4×5 or 20 or 7.6×5 or 38 or 1.6×10 or 16 or 4×2 or 8 or 4×3 or 12	M1	may be seen written on correct bar correct method for any frequency
3	$0.6 \times 10 + (122 - 120) \times 4$ or $0.6 \times 10 + 2 \times 4$ or $0.6 \times 10 + \dfrac{2}{5} \times 4 \times 5$ or $6 + 8$ or 14 or $16 + 38 + \dfrac{3}{5} \times 4 \times 5$ or 66	M1dep	oe
	$14 \times \dfrac{28\,000}{80}$ or $28\,000 - 66 \times \dfrac{28\,000}{80}$ or $23\,100$	M1dep	oe eg 14×350 $28\,000 - 66 \times 350$
	4900	A1	SC3 3850 or 6475

	Additional Guidance	
$0.3 \times 10 + 2 \times 4 = 11$ and $\dfrac{11}{80} \times 28\,000 = 3850$		SC3
$1.3 \times 10 + 7.3 \times 5 + 4 \times 3 = 61.5$ and $28\,000 - \dfrac{61.5}{80} \times 28\,000 = 6475$		SC3
$\dfrac{6+8}{80} \times 28\,000$ or $\dfrac{14}{80} \times 28\,000$		M3

Q	Answer	Mark	Comments
4(a)	20 × 0.8 or 16 or 20 × 1.8 or 36 or 40 × 1.2 or 48 or 40 × 0.7 or 28 or 60 × 0.4 or 24	M1	one correct area calculation or frequency value may be on diagram
	20 × 0.8 + 20 × 1.8 + 40 × 1.2 + 40 × 0.7 + 60 × 0.4 or 16 + 36 + 48 + 28 + 24 or 152	M1dep	allow 1 error or 1 omission or 1 misread of a frequency density value
	28	A1	

Q	Answer	Mark	Comment
5(a)	1.5 × 6 or 9 or 3.5 × 4 or 14 or 5 × 2 or 10 or 4.5 × 4 or 18 or 2.5 × 4 or 10	M1	oe values 9, 14, 10 or 18 must be in the correct row in the table or linked to the correct bar on the histogram
	1.5 × 6 × 3 or 9 × 3 or 27 or 3.5 × 4 × 8 or 14 × 8 or 112 or 5 × 2 × 11 or 10 × 11 or 110 or 4.5 × 4 × 14 or 18 × 14 or 252 or 2.5 × 4 × 18 or 10 × 18 or 180 or 681	M1dep	oe values 27, 112, 110, 252 or 180 must be in the correct row in the table
	(their 27 + their 112 + their 110 + their 252 + their 180) ÷ (their 9 + their 14 + their 10 + their 18 + their 10) or 681 ÷ 61	M1dep	oe full correct method eg (their 27 + their 112 + their 110 + their 252 + their 180) ÷ 61
	[11.16, 11.2]	A1	accept 11 with M3 scored and no errors

	Additional Guidance	
	Up to M2 may be awarded for correct work with no answer, or incorrect answer, even if this is seen amongst multiple attempts	

Time, x, (hours)	Frequency	Midpoint	
$0 \leqslant x < 6$	9	3	27
$6 \leqslant x < 10$	14	8	112
$10 \leqslant x < 12$	10	11	110
$12 \leqslant x < 16$	18	14	252
$16 \leqslant x < 20$	10	18	180

M1M1

5(a) cont

Time, x, (hours)	Frequency	Midpoint	
$0 \leqslant x < 6$	9	3	27
$6 \leqslant x < 10$	16	8	128
$10 \leqslant x < 12$	10	11	110
$12 \leqslant x < 16$	20	14	280
$16 \leqslant x < 20$	10	18	180

M1M1

Time, x, (hours)	Frequency	Midpoint	
$0 \leqslant x < 6$	1.5	3	4.5
$6 \leqslant x < 10$	3.5	8	28
$10 \leqslant x < 12$	5	11	55
$12 \leqslant x < 16$	4.5	14	63
$16 \leqslant x < 20$	2.5	18	45

M0M0

$(4.5 + 28 + 55 + 63 + 45) \div (1.5 + 3.5 + 5 + 4.5 + 2.5)$

$= 195.5 \div 17 = 11.5$

M0A0

Q	Answer	Mark	Comment
5(b)	Valid reason	B1	eg the data is grouped or the exact values are not used or the midpoints are estimates
	Additional Guidance		
	Because we are using midpoints		B1
	Midpoint is an average		B1
	There are no raw data		B1
	Numbers are rounded		B0
	There are no data to use		B0
	The answer is a decimal		B0
	Valid reason with an irrelevant statement		B1