1	(a)		$30 < t \leq 40$	1	B1	
	(b)	e.g. $5 \times 4 + 15 \times 10 + 25 \times 15 + 35 \times 25 + 45 \times 6$ (= 1690) **or** 20 + 150 + 375 + 875 + 270 (= 1690)		4	M2	For correct products using midpoints (allowing one error) with intention to add. If not M2 then award M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add or correct products using midpoint without addition.
		"1690" ÷ 60			M1	dep on M1
			28.2		A1	accept 28.1 – 28.2
						Total 5 marks

2	a		$50 < L \leq 60$	1	B1	oe eg 50 - 60
	b	$25 \times 6 + 35 \times 26 + 45 \times 31 + 55 \times 40 + 65 \times 17$ (150 + 910 + 1395 + 2200 + 1105)(= 5760)			M2	For correct products using midpoints (allow one error) with intention to add. M1 for products using frequency and a consistent value within the range (allow one error) with intention to add or correct products using midpoints (allow one error) without addition
		"5760" ÷ "120"			M1	dep on M1
			48	4	A1	
						Total 5 marks

3	a		10, 26, 70, 99, 114, 120	1	B1	
	b		correct cumulative frequency graph	2	B2	fully correct cf graph – points at ends of intervals and joined with curve or line segments If not B2 then B1 for 5 or 6 (ft from a table with only one arithmetic error) of their points at ends of intervals and joined with curve or line segments **OR** for 5 or 6 points plotted correctly at ends of intervals not joined **OR** for 5 or 6 of their points from table plotted consistently within each interval (not at upper ends of intervals) at their correct heights and joined with smooth curve or line segments
	c				M1	For use of 30 and 90, or 30.25 and 90.75 (eg reading of 21 and 37 stated or indicated by marks on horizontal axis that correspond to 30 (or 30.25) and 90 (or 90.75) on the vertical axis or correct readings ft their cf graph provided method to show readings is shown)
			16	2	A1	accept 14 – 18, ft from their cf graph (ft provided method to show readings is shown)
	d				M1	For use of cf from number of minutes late being 48 (eg an indication by a mark on the vertical axis corresponding to 48 mins late or a correct reading ft their cf graph)
			9	2	A1	accept 7 – 10, ft from their cf graph
						Total 7 marks

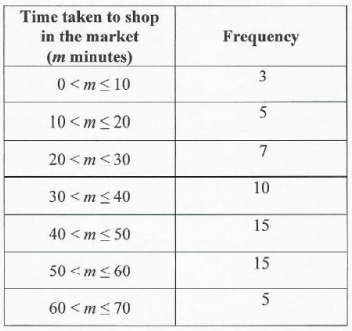
4	$10 \times 5 + 30 \times 11 + 50 \times 8 + 70 \times 19 + 90 \times 9$ (50 + 330 + 400 + 1330 + 810)		3	M2	Correct products using midpoints (allowing one error) with intention to add. M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add. or correct products using midpoints without addition (allow 1 error)
		2920		A1	N.B. 2920 ÷ 52 (=56.2..) scores M2A0
					Total 3 marks

5	(a)		$3 < w \leq 4$	1	B1
	(b)	$(12 \times 2.5) + (16 \times 3.5) + (9 \times 4.5) + (2 \times 5.5) + (1 \times 6.5)$ **or** $30 + 56 + 40.5 + 11 + 6.5$ (= 144)		4	M2 for at least **4** correct products added (need not be evaluated) **or** If not M2 then award M1 for consistent use of value within interval (including end points) for at least **4** products which must be added **or** correct midpoints used for at least **4** products and not added
		$[(12 \times 2.5) + (16 \times 3.5) + (9 \times 4.5) + (2 \times 5.5) + (1 \times 6.5)] \div 40$ **or** '144' ÷ 40			M1 (dep on at least M1) Allow division by their Σf provided addition or total under column seen
			3.6		A1 oe
	(c)	$\frac{2}{40} + \frac{1}{40}$		2	M1 for $\frac{a}{40}$ where $0 < a < 40$ or $\frac{3}{b}$ where $b > 3$ where a and b are integers
			$\frac{3}{40}$		A1 0.075 oe
					Total 7 marks

6	(a)	eg height of first bar labelled as FD 4 **or** one 1 cm by 1 cm square = 5 people **or** 1 line of 5 small squares = 1 person **or** one 2cm by 2 cm square = 20 people etc		2	M1	for the use of frequency density – ie that area is proportional to frequency – with either a correct frequency density unambiguously labelled on axis **or** for an area representing a correct number of people **or** 2 correct frequencies completed
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	35, 39, 56		A1	All 3 correct
	(b)		Correct bar	1	B1	Width from 30 – 60 and height 1 cm
	(c)	0.5 × "56" + 30 (= 58) **or** 40 + "35" + "39" + "56" + 30 (= 200)		2	M1ft	follow through **their** stated value for $20 \leq d < 30$ for total greater than 25 or ft **their** 3 values in the table for total
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	$\frac{58}{200}$		A1ft	ft dep on a completed table oe eg $\frac{29}{100}$ **or** 0.29 **or** 29%
						Total 5 marks

7	(a)		$70 < s \leq 80$	1	B1	
	(b)	$10 \times 45 + 16 \times 55 + 19 \times 65 + 23 \times 75 + 12 \times 85$ **or** 450 + 880 + 1235 + 1725 + 1020 (= 5310)		4	M2	$f \times d$ for at least 4 products with correct mid-interval values and intention to add. If not M2 then award M1 for d used consistently for at least 4 products within interval (including end points) and intention to add **or** for at least 4 correct products with correct mid-interval values with no intention to add
		"5310" ÷ 80			M1	dep on at least M1 allow division by their $\sum f$ provided addition or total under column seen
			66.4		A1	accept 66.37 – 66.4
						Total 5 marks

8	(a)		$48 < S \leqslant 54$	1	B1	Allow $48 - 54$ oe
	(b)	$(33 \times 4) + (39 \times 14) + (45 \times 18) + (51 \times 19) + (57 \times 5)$ or $132 + 546 + 810 + 969 + 285$ (= 2742) [lower bound products are: 120, 504, 756, 912, 270] [upper bound products are: 144, 588, 864, 1026, 300]		4	M2	M2 for at least **4** correct products added (need not be evaluated) **or** If not M2 then award: M1 for consistent use of value within interval (including end points) for at least **4** products which must be added or correct midpoints used for at least **4** products and not added
		$\frac{"2742"}{60}$			M1	dep on M1 Allow division by their Σf provided addition or total under column seen
		Correct answer scores full marks (unless from obvious incorrect working)	45.7		A1oe	$45\frac{7}{10}$ or $\frac{457}{10}$ (accept 46 from correct working)
						Total 5 marks

9	(a)		43.5 - 44.5	1	B1	±0.5 small square
	(b)	eg reading of 48 - 49		2	M1	For correct method to start the question eg a vertical line from 55 up to the line and a horizontal line from the correct point on the curve or a mark on the curve at the correct point and a mark on the vertical axis at the correct point or a correct reading of 48 to 49
		Correct answer scores full marks (unless from obvious incorrect working)	11 or 12		A1	Allow an answer of 11 or 12 (ie must be whole number)
	(c)			2	B2	All values correctly filled in (NB: first 2 are already completed) (B1 for 3 or 4 correct values from 7, 10, 15, 15, 5)
						Total 5 marks

Time taken to shop in the market (m minutes)	Frequency
$0 < m \leq 10$	3
$10 < m \leq 20$	5
$20 < m < 30$	7
$30 < m \leq 40$	10
$40 < m \leq 50$	15
$50 < m \leq 60$	15
$60 < m \leq 70$	5

10	$15 \times 5 + 45 \times 6 + 75 \times 8 + 105 \times 9 + 135 \times 2$ **or** $75 + 270 + 600 + 945 + 270$ [lower bound products are: 0, 180, 480, 810, 240] [upper bound products are: 150, 360, 720, 1080, 300]		3	M2	for correct products using midpoints (allow one error or omission) with attempt to add (M1 for products using a consistent value within range and attempt to add **or** for at least 4 correct products without addition)
	Correct answer scores full marks (unless from obvious incorrect working)	2160		A1	(an answer of 72 loses the final A mark but gains M2)
					Total 3 marks