1	(a)	Plots at midpoints of intervals	1	Condone one error/omission	Use overlay
		All seven heights correct (7, 10, 14, 9, 5, 3, 2)	1	Tolerance 1 mm	As well as correct, allow heights mark for bars or for plots not at midpoints but elsewhere in correct interval
		All plots joined with ruled straight line segments	1FT	Within 1 mm of points; FT for at least six points plotted	Ignore joins to axes from endpoints, but last mark not earned if endpoints are joined; bod if only one segment not clearly ruled Ignore bars if a frequency polygon also seen; otherwise bars can earn the mark for heights correct
	(b)	Midpts 25, 75, 125... seen or implied	M1	For 3 or more correct; need not be used	Eg may be seen by table
		$f \times x$ attempted	M1	Sum seen or at least 3 products seen FT *their* 'midpts'; their 'midpoints' need to be in the correct class; Eg 175, 750, 1750, 1575, 1125, 825, 650	Eg allow 2nd **M1** for use of endpts not midpts; 6850 implies first two Ms; working for 2nd **M1** may be by table First two **M1**s may be earned for correct work seen even if not then used in the final answer
		(*Their* sum of $f \times x$) ÷ 50 soi	M1	If correct: 6850 ÷ 50	May be earned even if their 'midpoints' are not in the correct class. Eg Midpt used as 50 throughout earns **M0M0M1** (their fx = 350, 500, 700 etc then 2500 ÷ 50)
		137	A1	Allow **B4** for 137 **SC2** for 162 or 112	

Question			Answer	Marks	Part Marks and Guidance	
2	(a)	(i)	6-10	1	0 if 8 also mentioned unless it is clearly given as reason	
		(ii)	11.4(3...)	4	nfww **M1** for midpoints 3, 8, 13 etc seen or used **and** **M1** for *their* midpoints × freq (0, 6, 64, 91, 108, 46, 28) **and** **M1** for (*their* sum of midpoints × freq) ÷ 30 Allow **A1** for 11 if **M3** earned and no errors seen	At least three of them seen; may be implied by products At least 3 correct or total 343 seen; Allow first two **M1**s if seen even if another method used for answer on answer line Second and third **M**s are available for '*their* midpoints' being an attempt using other points in interval, or endpoints (at least 3 seen) Answers of 9.7 or 13.16 -13.17 imply second and third M1s
	(b)	(i)	4	2	**M1** for $\dfrac{93}{1043} \times 50$ oe or for 4.4(...) rot to 2 or more sf	e.g. M1 for 93/20.86… after 1043/50 = 20.86 If nothing on answer line, allow 2 marks for 4 written by table by year 13

		(ii)	advantage: more reliable results	**1**	oe; accept 'more reliable' or 'more representative' 0 for 'more accurate' or 'more precise' without any reference to reliability or representation	see appendix for exemplar comments accept valid reasons even if qualified with additional comments
			disadvantage: takes longer to do survey	**1**	or longer to process results; or more difficult to collect/process results oe; or more work oe 0 for harder to interpret results	

3	(a)		e.g. - No, there could be another colour - No, he has not seen all the counters - No, he may have picked the same counter/colour multiple times	1		Condone e.g. - Yes, large number of (or 2000) trials - Yes, would have picked another colour by now - Yes, 2000 trials and only got red, blue and yellow See appendix for exemplar comments
	(b)	(i)	0.3265 0.2545 0.419 rot to at least 2dp	2	**B1** for one of these values rot to 1 dp or better oe	
		(ii)	e.g. - Large number of trials oe	1		Ignore other comments Condone: - Done it enough times oe - Done it 2000 times oe
		(iii)	0.581[0] or 0.58 oe	2	**M1** for *their* (0.3265 + 0.2545) or for 1 – *their* (0.419)	
		(iv)	10	2	**M1** for 24 × *their*(0.419) soi	For M1, if no working, check back – condone rounding up or down

4		Number of matches × frequency soi e.g. 46 × 7, 47 × 18 etc or 322, 846, 672, 490, 50 or 2380	**M1**	At least 3 correct products or values seen or total correct seen	Beware 2380 / 5 = 476 is incorrect and gets **M1**. Allow **M1** implied for 476 as answer without working
		÷ 50	**M1**	2nd **M1** independent of first	Could be implied
		47.6 www	**A1**	Allow **A1** for 48 only if first **M1** is earned and there is no wrong working or more accurate answer given as well Allow **B3** for 47.6 www	Beware 48 without working scores 0

5	(a)		18.2	4	nfww **M1** for midpoints 12.5, 17.5 etc (at least 3 correct) soi	eg may be seen by table
					M1 for *their* 'midpoints' × freq attempted soi sum seen or at least 3 products seen FT *their* 'midpoints'	eg at least 3 of 175, 350, 247.5, 137.5 or total 910 Working may be by table At least 3 midpoints must be in the correct group
					M1 for *their* sum of $f \times x \div 50$	If correct: $910 \div 50$
					Allow **A1** for 18 after correct method seen	eg allow 2nd and 3rd **M1**s for use of endpoints not midpoints
					Allow **SC2** for 20.7 and 15.7 (correct answers from endpoints used)	First two **M1**s may be earned for correct work seen even if not then used in the final answer Following use of 5 as *x* throughout, allow **M0M0M1** for reaching 250/50
	(b)	(	8	1		
		(ii)	21 to 21.5	1		
		(iii)	9.5 to 10.8	2	nfww **M1** for [UQ] 26.5 to 27.3 or for [LQ] 16.5 to 17	eg **0** for ¼ × 40 = 10 eg **M1** for answer of 27

6	(a)	(i)	45	2	**M1** for $\dfrac{5}{8} \times 72$ oe or $\dfrac{5}{their(1+2+5)} \times 72$ oe or for [1 share =] 9 or for 9 : 18 : 45 as answer	

		(ii)	1440	2	**M1** for $\frac{8}{2} \times 360$ oe or for [1 share =] £180	
	(b)		59.33 to 59.34 or 59.3(0)	4	**M1** for midpoints 10, 30, 50 etc seen or used **M1** for *their* midpoints × freq (20, 150, 350, 770, 270, 220; total 1780) **M1** for (*their* sum of midpoints × freq) ÷ 30 Allow **A1** for 59 if **M3** earned	At least three of them seen; may be implied by products Allow 9.99, 29.99, 49.99 etc At least 3 correct or total seen Accept 19.98, 149.95, 349.93, 769.89, 269.97, 219.98; total 1779.7 Allow first two **M1**s if seen even if another method used for answer on answer line Second and third **M**s are available for '*their* midpoints' being an attempt using other points in interval, or endpoints (at least 3 seen) Allow **M0M0M1** for 600/30 following consistent use of class-width 20 instead of midpoints Answers of 69.33 to 69.34 or 69.3(0) (or 49.33 to 49.34 or 49.3(0)) imply second and third **M1**s