

1	(a)		Pat, more spins oe	1		
	(b)		$\frac{88 + 62}{300 + 200}$ $\frac{150}{500}$ oe isw	M1 A1	B1 for answer $\frac{88}{300}$ oe soi	

2	(a)		There are overlaps eg 5 comes in two boxes There is no box for over 20 CDs (accept a numerical example eg 30)	1 1	Or needs responses with no overlaps eg 0-4, 5-9 etc Or needs responses covering all eventualities eg extra box for "21 or more" or extra box for "other"	See exemplars
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	(b)		260	4	nfw M1 for midpoints 50, 150, 250 etc (at least 3 correct) soi M1 for <i>their</i> 'midpoints' × freq attempted soi by 10400 or 10420 or at least 3 products seen FT <i>their</i> 'midpoints' M1 for <i>their</i> sum of $f \times x \div$ <i>their</i> sum of f Or SC3 for final answer 260.5 Or SC2 for final answer 210 or 310	eg may be seen by table Condone 50.5, 150.5 etc eg at least 3 of 100, 1500, 3750, 3150, 1350, 550 or total 10400 Working may be by table If correct: 10400 ÷ 40 eg allow 2 nd and 3 rd M1 s for use of endpoints not midpoints First two M1 s may be earned for correct work seen even if not then used in the final answer
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3	(a)		25	3	isw M2 for $\frac{100}{2^2}$ Or B1 for approximations of 100 or 2 seen	
	(b)	(i)	Underestimate. (BMI will be higher than 25 as) numerator has been rounded down or denominator up.	1		Not contradictory statements
		(ii)	Lose weight [because overweight]	1	Condone eat more healthily, exercise more etc providing no contradiction	Dependent on 25 and underestimate

4			90 × 0.8, 88 × 0.8, 88 × 0.75 or 90 × 0.75 oe	M2	This is their starting point and can be implied from clear working B1 for 90, 88, 0.2, 0.25, 0.8 or 0.75 oe seen	eg 90 – 90 × 0.2 scores M2 the subtraction can be implied eg × 20 then ÷ 100 or 20% is equivalent to 0.2 If 22% calculated max 2 marks
			Answer in the range 66 to 72	1	Independent	

5		35 or 25 or 37.5 following correct approximations	3	M2 for numerator 120 – 50 or 100 – 50 or 125 – 50 and denominator 3.3 – 1.3 or 3 - 1 or M1 for any 2 correct approximations seen	BOD if both parts reversed condone 37.5 rounded to 37 or 38 condone 3.5 – 1.5 in denominator SC1 for 74.6 ÷ 1.96 rounded to 75 ÷ 2 then answer of 37.5
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6	(a)	26	2	M1 for $20 \times 0.7 + 30 \times 0.4$ or for 14 found	[mark for whole bars found in next part]
	(b)	<p>Frequencies in each group soi: [6, 28], 40, 64, 38, 21, 12</p> <p>Sum of frequencies attempted</p> <p>Frequencies × midpoints attempted: $6 \times 5, 28 \times 20, 40 \times 40, 64 \times 60, 38 \times 80, 21 \times 105, 12 \times 135$</p> <p><i>Their</i> total of midpoints × freq ÷ <i>their</i> sum of frequencies</p> <p>61.69 to 61.70 or 62</p>	<p>M1</p> <p>M1</p> <p>M1</p> <p>M1</p> <p>A1</p>	<p>Allow this M1 for four or more correct</p> <p>209 if correct</p> <p>At least 3 correct or FT correct: may be 30, 560, 1600, 3840, 3040, 2205, 1620 [total = 12895]</p> <p>May be implied by correct answer or by FT answer if <i>their</i> total seen; total of frequencies = 209 if correct</p> <p>nfw</p>	<p>Allow 5, 5.005, 5.5(0) as midpoint for first group and similarly for others</p> <p>Allow FT from endpoints used for midpoints for this last M1</p>

7	(a)		Ruled line of best fit	1	Within limits of overlay	
	(b)		11 or 12 only	1		
	(c)		Positive	1		Ignore 'strong' etc