Estimating

Question	Answer	Mark	Mark scheme	Additional guidance
11 (a)	248	P1	for 700 – 452	
		A1	cao	
(b)	11000	P1	for evidence of rounding values to 1 significant figure, eg 300 **or** 400 **or** 10 or 9 **or** 20	
		P1	(dep on P1) for beginning a process to work with ticket sales, eg. 300 × 10 (= 3000) or 290 × 10 (= 2900) or 297 × 10 (= 2970) or 300 × 9 (= 2700) or 300 × 9.5 (= 2850) or 290 × 9 (= 2610) or 297 × 9 (= 2673) **OR** 400 × 20 (= 8000) or 390 × 20 (= 7800) or 399 × 20 (= 7980) or 400 × 19.5 (= 7800) or 400 × 19 (= 7600)	Note: **not** 290 × 9.5 (= 2755) or 297 × 9.5 (= 2821.5) Note: **not** 390 × 19 (= 7410) or 390 × 19.5 (= 7605) or 399 × 19 (= 7581) or 399 × 19.5 (= 7780.5)
		A1	for using **correct** values giving an answer in the range 10 200 to 11 000 from calculations using their rounded values	Award 0 marks for an answer in the range with no supportive working
(c)	Overestimate with reason	C1	(dep on P2 in (b)) for overestimate and reason, eg (ft from (b)) true total amount of money paid will be less as all values were rounded up	Must relate to estimation and not to rounding of their final answer and they must have a final answer to part (b)

Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	180	M1	rounds one figure appropriately 92 to 90 or 100 **or** 1.63 to 2 or 1.5 or 1.6 or 1.7	
		A1	for 180 (= 90×2) or 135 (= 90×1.5) or 144 (= 90×1.6) or 153 (= 90 × 1.7) or 200 (= 100×2) or 150 (= 100×1.5) or 160 (= 100×1.6) or 170 (= 100 × 1.7) or 163 (= 100×1.63) or 184 (= 92 × 2) or 138 (= 92 × 1.5) or 147.2 (= 92 × 1.6) or 156.4 (= 92 × 1.7)	Answer of 149.96 (92 × 1.63) gets M0A0 Answer with no working gets M0A0 Ignore further rounding of their result
(b)	947.2	B1	cao	

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Question	Answer	Mark	Mark scheme	Additional guidance
18	4550 to 4800	M1	for rounding at least two figures to 800, 50, 300 or 290 (which could be evidenced through partial calculation)	Any attempt to find the exact answer gets NO marks even if followed by rounding
		M1	(dep) for a correct calculation using their rounded values eg. sight of 240000 (= 800 × 300) **or** 232000 (= 800 × 290) **or** 229100 (= 790 × 290) **or** 16 (= 800 ÷ 50) **or** 15.8 = (790 ÷ 50) **or** 6 (= 300 ÷ 50) **or** 5.8 = (290 ÷ 50)	Various operations possible
		A1	for answer in range 4550 to 4800	

Question	Answer	Mark	Mark scheme	Additional guidance
22 (a)	Estimated time	P1	for rounding of distance = 5 (miles) or speed = 30 (mph)	
		P1	(dep) for using time = distance / speed eg $5 \div 30$ **or** for a complete process, eg $30 \div 60 \ (= 0.5)$ **and** $5 \div$ "0.5" or $30 \div 5 \ (= 6)$ **and** $60 \div$ "6" or $4.96 \times \frac{60}{30}$	
		A1	for a correct answer following through their correct rounded distance and/or speed	
(b)	Overestimate with reason	C1	ft from (a) for decision with correct reasoning, eg overestimate as dividing a larger number by a smaller number or overestimate as miles rounded up and speed rounded down	Ft the rounding and process from (a) Must relate to estimation and not rounding of their final answer and they must have a final answer to part (a)

Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	Estimated value	P1	for using a value rounded to 1sf in a calculation eg 500 ÷ 10 **or** 500 × 0.8 **or** 510 × 0.8 **or** 513 × 0.8 **or** 500 × 0.81	Their rounded value must be used in a calculation Rounding may occur after a correct process, eg 513 ÷ 10 = 51.3 ≈ 50 and 50 × 0.81 513 ÷ 10 = 51.3 ≈ 51 and 51 × 0.8 scores P1P1 Accept 0.81 rounded to 0.80 for this mark Condone 0.81 rounded to 1 for this mark.
		P1	for a full process to find the total amount eg 500 ÷ 10 × 0.8 (= 40) **or** 510 ÷ 10 × 0.8 (= 40.8) **or** 500 ÷ 10 × 0.81 (= 40.5) or [distance] ÷ 10 × [amount] oe	Where [distance] is their rounded 513 or 513 and [amount] is their rounded 0.81 or 0.81 Accept 513 ÷ 10 × 0.81 for this mark.
		A1	for a correct answer following through their correct rounded value(s)	Do not award this mark if 0.81 is rounded to 1
(b)	underestimate with reason	C1	ft from (a) eg underestimate as numbers rounded down	Must relate to estimation and not rounding of their final answer and they must have a final answer to part (a)

Question	Answer	Mark	Mark scheme	Additional guidance
26	160 to 200	M1	rounds one figure appropriately (6, 8, 0.25 or 0.3)	Do not award any marks for an accurate calculation if then rounded
		M1	(dep) for carrying out an accurate calculation using 0.25 or 0.3 eg $6 \div 0.3 = 20$, $8 \div 0.25 = 32$, $6 \div 0.25 = 24$ **or** digits 16	
		A1	Answer in the range 160 to 200 from appropriate rounding	