

Q1 june 2017

18	(a)		6 to 8	M1	evidence of recall of area formula with correct radius e.g. $\pi \times 10^2$	
				M1	calculation to find number of boxes, $(\text{area}) \div (\text{coverage figure})$	
				M1	(indep) evidence of estimation, eg π in range 3 to 3.2, or coverage figure of 40, 42, 45, 48 or 50	
				A1	(dep on M3) answer in the range 6 to 8	
	(b)		underestimate	C1	e.g. (ft from (a)) underestimate: true area greater so could need more boxes. Must relate to estimation, not rounding of answer.	

Q2 june 2018

22	(a)	Estimated value	P1	for using a rounded value in a correct process eg $3000 \div 15$ or 15×8 or 20×8	Their rounded value must be used in a calculation
			P1	for a full process to find the number of days eg $"3000" \div "15" \div "10" (= 20)$ or $"3000" \div "15" \div 8 (= 25)$	Rounding may appear after a correct process eg $15.12 \times 8 = 120.96 \approx 100$ followed by eg $3069.25 \div 100$
			A1	for a correct answer following through their rounded values	Accept $3069.25 \div 15.12 \div 8$ oe
	(b)	Explanation	C1	eg less days required or it doesn't affect the answer because I would still round 16.27 down to 15 (or up to 20)	Refers to time taken

Q3 june 2020

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 $240000 (= 800 \times 300)$ or $232000 (= 800 \times 290)$ or $229100 (= 790 \times 290)$ or $16 (= 800 \div 50)$ or $15.8 (= 790 \div 50)$ or $6 (= 300 \div 50)$ or $5.8 (= 290 \div 50)$	Various operations possible
			A1	for answer in range 4550 to 4800	

Q4 june 2022

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 $180 (= 90 \times 2)$ or $135 (= 90 \times 1.5)$ or $144 (= 90 \times 1.6)$ or $153 (= 90 \times 1.7)$ or $200 (= 100 \times 2)$ or $150 (= 100 \times 1.5)$ or $160 (= 100 \times 1.6)$ or $170 (= 100 \times 1.7)$ or $163 (= 100 \times 1.63)$ or $184 (= 92 \times 2)$ or $138 (= 92 \times 1.5)$ or $147.2 (= 92 \times 1.6)$ or $156.4 (= 92 \times 1.7)$	Answer of $149.96 (92 \times 1.63)$ gets M0A0
	(b)	947.2	B1	cao	Answer with no working gets M0A0 Ignore further rounding of their result

Q5 june 2023

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. $300 \times 10 (= 3000)$ or $290 \times 10 (= 2900)$ or $297 \times 10 (= 2970)$ or $300 \times 9 (= 2700)$ or $300 \times 9.5 (= 2850)$ or $290 \times 9 (= 2610)$ or $297 \times 9 (= 2673)$ OR $400 \times 20 (= 8000)$ or $390 \times 20 (= 7800)$ or $399 \times 20 (= 7980)$ or $400 \times 19.5 (= 7800)$ or $400 \times 19 (= 7600)$	Note: not $290 \times 9.5 (= 2755)$ or $297 \times 9.5 (= 2821.5)$ Note: not $390 \times 19 (= 7410)$ or $390 \times 19.5 (= 7605)$ or $399 \times 19 (= 7581)$ or $399 \times 19.5 (= 7780.5)$
			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)

Q6 june 2024

24	(a)	Estimated value	P1	for using a value rounded to 1sf in a calculation eg $500 \div 10$ 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 $513 \div 10 = 51.3 \approx 50$ and 50×0.81 $513 \div 10 = 51.3 \approx 51$ 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 $500 \div 10 \times 0.8 (= 40)$ or $510 \div 10 \times 0.8 (= 40.8)$ or $500 \div 10 \times 0.81 (= 40.5)$ or [distance] $\div 10 \times$ [amount] oe	Where [distance] is their rounded 513 or 513 and [amount] is their rounded 0.81 or 0.81 Accept $513 \div 10 \times 0.81$ 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)

Q7 Nov 2017

16	(a)		Explanation	C1	eg States over-estimated for both values
	(b)		182.7(0)	P1	for a process to find 10% of a value stated in the question eg $\frac{10}{100} \times 5.80 (= 0.58)$ or $\frac{10}{100} \times 35 (= 3.5)$ oe or $35 \times 5.80 (= 203)$, allow $30 \times 5.80 (= 174)$ or $35 \times$ [reduced price]
				P1	for a process to find 90% of a value stated in the question eg $35 - "3.5" (= 31.5)$ or $0.9 \times 5.80 (= 5.22)$ oe or $\frac{10}{100} \times "203" (= 20.3)$ or $\frac{10}{100} \times "174" (= 17.4)$ oe
				P1	for a complete process to find actual cost of 35 eg $0.9 \times 5.80 \times 35$ oe
				A1	cao SC B2 156.6(0)

Q8 Nov 2017

Subtopic: Approximation and Estimation

20		Ami	M2	for an approximate calculation eg $\frac{600}{16+5}$ or $\frac{600}{21}$ or $\frac{600}{20}$ or $\frac{600}{20+5}$ or $\frac{600}{25}$ or $\frac{600}{25+5}$ or $\frac{600}{30}$ or $\frac{595}{20}$
		with estimate	(M1)	for using 600 or 5 or 4)
			C1	Ami's answer /27.1115 is closest with accurately calculated figure from approximation

Q9 Nov 2020

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	

Q10 Nov 2023

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 ÷ 0.3 = 20, 8 ÷ 0.25 = 32, 6 ÷ 0.25 = 24 or digits 16	
		A1	Answer in the range 160 to 200 from appropriate rounding	

Q11 Nov 2024

22	(a)	Estimated time	P1	for rounding of distance = 5 (miles) or speed = 30 (mph)	
			P1	(dep) for using time = distance / speed eg 5 ÷ 30 or for a complete process, eg 30 ÷ 60 (= 0.5) and 5 ÷ "0.5" or 30 ÷ 5 (= 6) and 60 ÷ "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)