

Q1. (2021)

Q	Answer	Mark	Comments
24	$\frac{731}{x} + \frac{287}{x-24} = 2$	M1	oe equation
	$731(x-24) + 287x$ or $731x - 17544 + 287x$	M1dep	oe allow with denominator $x(x-24)$ oe
	$2x^2 - 1066x + 17544 (=0)$ or $x^2 - 533x + 8772 (=0)$	A1	oe eg $x^2 - 533x = -8772$
	$\frac{-(-1066) \pm \sqrt{(-1066)^2 - 4 \times 2 \times 17544}}{2 \times 2}$ or $\frac{1066 \pm \sqrt{1136356 - 140352}}{2 \times 2}$ or $\frac{1066 \pm \sqrt{996004}}{2 \times 2}$ or $\frac{1066 \pm 998}{2 \times 2}$ or $(2x - 34)(x - 516)$ or 17 and 516	M1	ft their 3-term quadratic oe eg $\frac{-(-533) \pm \sqrt{(-533)^2 - 4 \times 1 \times 8772}}{2 \times 1}$ or $\frac{533 \pm \sqrt{284089 - 35088}}{2 \times 1}$ or $\frac{533 \pm \sqrt{249001}}{2 \times 1}$ or $\frac{533 \pm 499}{2}$ or $(x - 17)(x - 516)$
	516	A1	must discard 17
	Additional Guidance		
	First M1 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts		
	3rd M1 Allow ft of their 3-term quadratic even if discriminant is ≤ 0		
	In quadratic formula, allow eg 1066^2 for $(-1066)^2$		

Q2. (2022)

Q	Answer	Mark	Comments
26	$18.9 \div 0.45$ or 42	M1	oe
	their $42 \div 7 \times 8$ or 48	M1dep	oe eg $\frac{8}{7} \times$ their 42 or $[1.14, 1.143] \times$ their 42
	$0.45 \div 9 \times 5$ or 0.25	M1	oe eg $\frac{5}{9} \times 0.45$ or $[0.55, 0.56] \times 0.45$ $\frac{8}{7} \times \frac{5}{9} \times 18.9$ oe scores M3
	12	A1	
	Additional Guidance		
	Up to M3 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts		
	Any single calculation or set of calculations that are a correct method and lead to 12		M3
	Note that the single calculation $\frac{8}{7} \times \frac{5}{9} \times 18.9$ does not use 0.45		M3
	An oe for $\frac{8}{7} \times \frac{5}{9} \times 18.9$ is $\frac{8}{7} \times \frac{18.9}{0.45} \times \frac{5}{9} \times 0.45$		M3
	Values may be seen in ratios eg 42 : 48		M1M1

Q3. (2022)

Q	Answer	Mark	Comments
7	Alternative method 1 Words per minute or words per second		
	416 ÷ 8 or 52	M1	oe eg 416 ÷ (8 × 60) or 416 ÷ 480 or $\frac{13}{15}$ or [0.86, 0.87] or 0.9
	1534 ÷ their 52 or (1534 – 416) ÷ their 52 + 8 or 29.5	M1dep	oe eg 1534 ÷ their [0.86, 0.87] or (1534 – 416) ÷ their [0.86, 0.87] + 8 × 60 or 1770
	29 minutes 30 seconds	A1	SC2 29 minutes 50 seconds or 29 minutes 5 seconds
	Alternative method 2 Minutes per word or seconds per word		
	8 ÷ 416 or $\frac{1}{52}$ or [0.019, 0.019231] or 0.02	M1	oe eg 8 × 60 ÷ 416 or 480 ÷ 416 or $\frac{15}{13}$ or [1.15, 1.154] or 1.2
	1534 × their [0.019, 0.019231] or (1534 – 416) × their [0.019, 0.019231] + 8 or 29.5	M1dep	oe eg 1534 × their [1.15, 1.154] or (1534 – 416) × their [1.15, 1.154] + 8 × 60 or 1770
	29 minutes 30 seconds	A1	SC2 29 minutes 50 seconds or 29 minutes 5 seconds

7 cont	Alternative method 3 Essay words ÷ report words		
	1534 ÷ 416 or $\frac{59}{16}$ or [3.68, 3.69] or 3.7 or (1534 – 416) ÷ 416 or [2.68, 2.69] or 2.7	M1	oe
	8 × their [3.68, 3.69] or 8 × their [2.68, 2.69] + 8 or 29.5	M1dep	oe eg 8 × 60 × their [3.68, 3.69] or 8 × 60 × their [2.68, 2.69] + 8 × 60 or 1770
	29 minutes 30 seconds	A1	SC2 29 minutes 50 seconds or 29 minutes 5 seconds
	Additional Guidance		
	M1 may be awarded for correct work with no, or incorrect answer, even if this is seen amongst multiple attempts		
	Answer 29.5 minutes 1770 seconds		M1M1A0
	Build-up method must be a fully correct method that would lead to 29.5		
	If working with report words ÷ essay words apply the principles of Alt 3		

Q4. (2023)

Q	Answer	Mark	Comments
13	$80 \times x$ or $80x$ or $x \times 80$ or $x80$ or $x \div 60$ or $\frac{x}{60}$ or $\frac{1}{60}x$ or $x \frac{1}{60}$ or $80 \div 60$ or $\frac{80}{60}$	M1	teabags per hour boxes per minute
	$\frac{80x}{60} \left(= \frac{4x}{3} \right)$ or $80 \div 60 \times x \left(= \frac{4x}{3} \right)$	A1	oe showing 80 and 60 and x eg $\frac{80 \times x}{60} \left(= \frac{4x}{3} \right)$ or $x \frac{80}{60} \left(= \frac{4x}{3} \right)$ or $\frac{80}{60} \times x \left(= \frac{4x}{3} \right)$ or $80x \div 60 \left(= \frac{4x}{3} \right)$
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Do not allow M1 if only seen embedded in an incorrect expression or calculation eg $80x \times 4 = 320x$		M0
	$60 \times \frac{4x}{3} = 80x$ (M1 allowed as $80x$ is not embedded in an incorrect expression or calculation, A0 because using the given answer)		M1A0
	Condone $x = 80 \div 60$		M1A0
	$\frac{80x}{60} \left(= \frac{4x}{3} \right)$		M1A1
	$\frac{80}{60} = \frac{4}{3}$ and $\frac{4}{3} \times x \left(= \frac{4x}{3} \right)$ $\frac{80}{60} = \frac{4}{3}$ and $\frac{4x}{3}$		M1A1
			M1A0
	No equivalents allowed for M1		
	Ignore units		
	Condone 1.33(...) for $\frac{4}{3}$		
	Ignore non-contradictory working after M1A1 seen		

Q5. (2024)

Q	Answer	Mark	Comments
15	Alternative method 1: works out concrete poured in 30 minutes		
	$10.9 \times 30 \times 60 \div 1000$ or $19.6(2)$ or $10.9 \times 30 \times 60$ or 19620 and 20×1000 or 20000	M3	oe full method eg $10.9 \times 1800 \div 1000$ or $30 \times 654 \div 1000$ or $19620 \div 1000$ M2 two correct steps eg $10.9 \times 30 \times 60$ or 19620 or $10.9 \times 30 \div 1000$ or 0.327 or $10.9 \times 60 \div 1000$ or 0.654 or $30 \times 60 \div 1000$ or 1.8 M1 one correct step eg 10.9×30 or 327 or 10.9×60 or 654 or $10.9 \div 1000$ or 0.0109 or 30×60 or 1800 or $30 \div 1000$ or 0.03 or $60 \div 1000$ or 0.06 or 20×1000 or 20000
	$19.6(2)$ and No or 19620 and 20000 and No	A1	oe eg 19.62 so it isn't

Question 15 continues on the next page

15 cont	Alternative method 2: works out time for 20 tonnes at given rate		
	$20 \times 1000 \div 10.9 \div 60$ or $[30.5, 30.6]$ or $20 \times 1000 \div 10.9$ or $[1834, 1835]$ and 30×60 or 1800	M3	oe full method eg $20000 \div 10.9 \div 60$ or $20 \times [91.7, 91.74312] \div 60$ or $[1834, 1835] \div 60$ M2 two correct steps eg $20 \times 1000 \div 10.9$ or $[1834, 1835]$ or $20 \times 1000 \div 60$ or 333(...) or $20 \div 10.9 \div 60$ or $[0.0305, 0.031]$ or $1000 \div 10.9 \div 60$ or $[1.52, 1.53]$ M1 one correct step eg 20×1000 or 20000 or $20 \div 10.9$ or $[1.83, 1.835]$ or $20 \div 60$ or 0.33(...) or $1000 \div 10.9$ or $[91.7, 91.74312]$ or $1000 \div 60$ or $[16.6, 16.7]$ or 10.9×60 or 654 or 30×60 or 1800
	$[30.5, 30.6]$ and No or $[1834, 1835]$ and 1800 and No	A1	oe eg 30.6 so it isn't
	Additional Guidance		
	Up to M2 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	M3 or M2 will usually be seen in stages eg Alt 1 $10.9 \times 30 = 327$ $327 \times 60 = 19620$ $19620 \div 1000$	M3	
	M2 or M1 may be seen embedded in more than one step (extra steps could be incorrect)		
	No may be indicated by selecting the box or a statement in the working lines		
	No cannot be implied only by an inequality		
	A correct value is sufficient for showing working eg Alt 1 19.62 and No	M3A1	
	Ignore their units throughout		
	Other approaches are possible eg works out rate in kg per s for 20 tonnes in 30 minutes and compares to 10.9		