1	**Alternative method 1**		
	110 ÷ 2 or 55 or 2 ÷ 110 or 0.018(1…) or 0.0182 or 44 ÷ 110 or 0.4 or 110 ÷ 44 or 2.5	M1	oe
	44 ÷ (110 ÷ 2) or 0.8 or $\frac{4}{5}$	M1dep	oe eg 2880 or calculation that would evaluate to 0.8 eg 2 ÷ 110 × 44 or 44 ÷ 110 × 2 or 2 ÷ (110 ÷ 44) or $\frac{110 \div 44}{110 \div 2} - 2$ or $2.8 - 2$
	48	A1	
	Alternative method 2		
	110 ÷ 2 ÷ 60 or 0.916… or 0.917 or 0.92 or 2 × 60 ÷ 110 or 1.09(0…) or 1.091	M1	oe
	44 ÷ (110 ÷ 2 ÷ 60)	M1dep	oe calculation that would evaluate to 48 eg 44 × 2 × 60 ÷ 110
	48	A1	

1 cont	**Additional Guidance**	
	Ignore units for M marks eg 55 miles	M1
	Do not award A1 if premature approximation for 48 seen eg (Alt 1) 0.018 × 44 = 0.8 Answer 48 (Alt 1) 0.018 × 44 = 0.792 and 0.792 × 60 = 47.52 Answer 48 (Alt 2) 44 ÷ 0.917 = 48 (Alt 2) 44 ÷ 0.917 = 47.9 Answer 48 (Alt 2) 44 × 1.09 = 48 (Alt 2) 44 × 1.09 = 47.96 Answer 48	 M2A1 M2A0 M2A1 M2A0 M2A1 M2A0
	48 followed by answer 2 h 48 min	M2A0
	48 followed by answer 168 min	M2A0
	Allow M1 even if not subsequently used	
	Alt 1 Working in seconds leading to 2880	M2

Question	Answer	Mark	Comments
2	62 ÷ 2 or 62 × 0.5 or 31	M1	oe eg 62 ÷ 60 × 30
	their 31 – 25 or 6	M1	their 31 must be > 25
	their 6 × 3 or 18 or their 6 × 4 or 24	M1dep	dep on 2nd M1
	49	A1	
	Additional Guidance		
	49 from correct working, but a different answer given		M3A0

Q	Answer	Mark	Comments
3	**Alternative method 1 – compares speeds in m/s**		
	200 ÷ 24 or 8.3(3…)	M1	oe eg $\frac{200}{24}$ or $8\frac{1}{3}$
	28.8 × 1000 ÷ 60 ÷ 60 or 8	M1	oe eg 28 800 ÷ 3600 or 28.8 ÷ 3.6
	8 and 8.3(3…) and Tom	A1	oe eg 8 and $8\frac{1}{3}$ and Tom
	Alternative method 2 – compares speeds in km/h		
	200 ÷ 24 or 8.3(3…)	M1	oe eg $\frac{200}{24}$ or $8\frac{1}{3}$
	their 8.3(3…) ÷ 1000 × 60 × 60 or 30	M1dep	oe eg 0.008 3(3…) × 3600
	30 and Tom	A1	
	Alternative method 3 – time for Adil starting with m/s		
	28.8 × 1000 ÷ 60 ÷ 60 or 8	M1	oe eg 28 800 ÷ 3600
	200 ÷ their 8 or 25	M1dep	oe eg $\frac{200}{8}$
	25 and Tom	A1	oe eg Tom by 1s
	Alternative method 4 – time for Adil starting with km/h		
	$\frac{200 \div 1000}{28.8}$ or [0.0069, 0.007] or $\frac{200}{28.8}$ or [6.9, 7]	M1	oe eg $\frac{0.2}{28.8}$ eg $\frac{125}{18}$
	their [0.0069, 0.007] × 60 × 60 or their [6.9, 7] ÷ 1000 × 60 × 60 or 25	M1dep	oe eg $\frac{0.2}{28.8}$ × 3600
	25 and Tom	A1	oe eg Tom by 1s

Q	Answer	Mark	Comments
3 cont	**Alternative method 5 – distance for Adil in 24s**		
	28 800 × 24 or 691 200 or 28.8 ÷ 60 ÷ 60 or 0.008 or 28.8 × 24 or 691.2	M1	oe eg $\frac{3456}{5}$
	their 691 200 ÷ 60 ÷ 60 or their 0.008 × 1000 × 24 or their 691.2 × 1000 ÷ 60 ÷ 60 or 192	M1dep	oe eg 28 800 × 24 ÷ 3600
	192 and Tom	A1	
	Additional Guidance		
	Up to M2 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts		
	Ignore all units		
	Allow other correct comparisons eg 500 and 480 (this is metres per minute) eg 500 and 480 and Tom		M1M1 M1M1A1
	200 m = 0.2 km, 24 s = 24 ÷ 60 ÷ 60 = $\frac{1}{150}$ hour, 0.2 ÷ $\frac{1}{150}$ = 30 and Tom		M1M1A1
	$\frac{200 \div 1000}{24} = \frac{1}{120}$ (or 0.0083…)		M1

Q	Answer	Mark	Comments
4	$60 \div 20$ or 3 or $20 \div 60$ or $\frac{1}{3}$ or $18 \div 20$ or 0.9 or $20 \div 18$ or 1.1(1…) or $20 + 20 + 20$	M1	oe
	their 3×18 or $18 \div$ their $\frac{1}{3}$ or their 0.9×60 or $60 \div$ their 1.1(1...) or $18 + 18 + 18$	M1dep	oe full method to get to answer
	54	A1	
	Additional Guidance		
	Up to M2 may be awarded for multiple attempts if no answer chosen		
	For up to M2 ignore any units		

Q	Answer	Mark	Comments
5	$0.5 \times \pi \times 45$ or $0.5 \times$ [141, 141.4] or [70.5, 70.7] or $0.5 \times \pi \times 45 + 75$ or [145.5, 145.7]	M1	oe eg 22.5π
	$(0.5 \times \pi \times 45 + 75) \div 18$ or their [145.5, 145.7] $\div 18$	M1	oe their [145.5, 145.7] can be any value
	8.08(…) or 8.09(…)	A1	may be implied by 8.1
	8.1	B1ft	ft any answer seen with greater than 2 sf SC2 3.9
	Additional Guidance		
	Up to M2 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts, B1ft may also be awarded		
	$\frac{120}{18} = 6.67$ answer 6.7		M0M1A0B1ft
	$\frac{120}{18} = 6.7$		M0M1A0B0ft
	$0.5 \times \pi \times 45$ and $70.7 \div 18 = 3.93$ answer 3.9		M1M1A0B1ft
	SC2 for an answer of 3.9 without working is when 75 is not used		

Q	Answer	Mark	Comments
6	A change in distance for an integer time interval or a change in distance for a non-integer time interval with the corresponding time interval	M1	integer time intervals are [88, 92] [70, 74] [52, 56] [34, 38] [16, 20] may be seen on graph
	$\frac{\text{their change in distance}}{\text{corresponding time interval}}$	M1dep	oe eg $\frac{[88, 92]}{5}$ must see their change in distance and the corresponding time interval division by 1 may be implied
	18	A1	SC1 24
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	90×5		M1M0
	(1 second) Answer [16, 20] is awarded at least M2		
	18 from incorrect working cannot score A1		
	18 followed by further work eg $18 \div 5 = 3.6$		M1M0

Q	Answer	Mark	Comments
7(a)	**Alternative method 1: working in metres per second or kilometres per second**		
	1500 (metres) or 0.05 (km)	B1	implied by 30 or 1200
	their 1500 ÷ 50 × 40 or 1.5 ÷ their 0.05 × 40 or 1200	M2	oe M1 their 1500 ÷ 50 or 30 oe or 50 ÷ 40 or 1.25 oe or 1.5 ÷ their 0.05 oe their 1500 must be using digits 15 (and zeros) their 0.05 must be using single digit 5 (and zeros)
	their 1200 ÷ 60	M1dep	oe dep on M2
	20	A1ft	ft their 1500 or their 0.05
	Alternative method 2: working in metres per minute or kilometres per minute		
	1500 (metres) or 0.05 (km)	B1	implied by 0.075
	40 ÷ 60 or $\frac{2}{3}$	M1	oe accept [0.66, 0.67]
	50 ÷ (40 ÷ 60) or 75 or $\frac{\text{their } 0.05}{(40 \div 60)}$ or 0.075 or their 1500 × (40 ÷ 60)	M1dep	oe calculation their 1500 must be using digits 15 (and zeros) their 0.05 must be using single digit 5 (and zeros)
	their 1500 ÷ their 75 or 1.5 ÷ their 0.075 or their 1500 × (40 ÷ 60) ÷ 50	M1dep	oe
	20	A1ft	ft their 1500 or their 0.05

	Additional Guidance	
7(a) cont	1500 ÷ 1.25	B1M2
	1.5 ÷ 50 × 40 their 1500 must be using digits 15 (and zeros)	B0M2
	1.5 ÷ 0.5 × 40 their 0.05 must be using single digit 5 (and zeros)	B0M2
	150 ÷ 50 their 1500 must be using digits 15 (and zeros)	B0M1
	150 ÷ 1.25 = 120, 120 ÷ 60 = 2	B0M2M1A1ft

Q	Answer	Mark	Comments
7(b)	It is greater than the answer to part (a)	B1	