

Q1. (2017)

24	Draws a tangent at 1 second	M1	
	Their gradient at 1 second	A1ft	Must see a tangent on the graph ft their tangent ± 0.2 tolerance on vertical reading ± 0.1 tolerance on horizontal reading
	Additional Guidance		

Q2. (2018)

24(a)	Alternative method 1		
	$\frac{1}{2} \times 10 \times 20$ or 100	M1	oe Area of triangle on left
	$\frac{1}{2} \times (20 + 30) \times 10$ or 250 or 20×10 or 200 and $\frac{1}{2} \times 10 \times 10$ or 50	M1	oe Area of trapezium on right
	350	A1	
	Alternative method 2		
	$\frac{1}{2} \times 10 \times 10$ or 50	M1	oe Area of triangle on top right
	$\frac{1}{2} \times (20 + 10) \times 20$ or 300 or 10×20 or 200 and $\frac{1}{2} \times 10 \times 20$ or 100	M1	oe Area of trapezium across bottom
	350	A1	
	Additional Guidance		
	$\frac{1}{2} \times (0 + 2 \times 20 + 30) \times 10$ (using Trapezium rule)	M1M1	
	Beware of 300 from incorrect working		
	Beware $(30 - 20) \times (20 - 10) = 100$ is incorrect working		

Q3. (2019)

27	$\sqrt{144}$ or 12	B1	radius of larger circle may be seen on diagram
	$\frac{4}{5} \times \text{their } 12$ or 9.6	M1	their 12 must be a value may be seen on diagram
	$(\cos AOB =)$ $\frac{\text{their } 12^2 + \text{their } 9.6^2 - 20^2}{2 \times \text{their } 12 \times \text{their } 9.6}$ or $\frac{144 + 92.16 - 400}{230.4}$ or $-\frac{32}{45}$ or $-0.71\dots$	M1dep	oe
	$\cos^{-1} \text{ their } -\frac{32}{45}$	M1dep	dep on M2
	135.(...)	A1	
	Additional Guidance		
	144 $\frac{4}{5} \times 144 = 115.2$ $(\cos AOB =) \frac{144^2 + 115.2^2 - 20^2}{2 \times 144 \times 115.2}$		B0 M1 M1M0A0
	12 seen, but a different value used for the radius of the larger circle cannot score B1M1		
	$x + y = 12$ seen, but $x = 6$ used to find radius $OA = 4.8$		B0M1

Q4. (2019)

28(a)	$\frac{1}{2} \times 5 \times 8$ or 20 or $\frac{1}{2} \times (8 + 9) \times (9 - 5)$ or 34	M1	oe eg $\frac{1}{2} \times 4 (\times 1)$ and 4×8 or 2 and 32
	$\frac{1}{2} \times 5 \times 8$ or 20 and $\frac{1}{2} \times (8 + 9) \times (9 - 5)$ or 34	M1dep	$\frac{1}{2} \times 4 (\times 1)$ and 4×8 or 2 and 32
	$\frac{1}{2} \times (9 + 4.6) \times 1$ $+ \frac{1}{2} \times (4.6 + 2) \times 1$ $+ \frac{1}{2} \times 1 \times 2$ or $6.8 + 3.3 + 1$ or 11.1 or $\frac{1}{2} \times (9 + 4.6) \times 1 + \frac{1}{2} \times 2 \times 4.6$ or $6.8 + 4.6$ or 11.4 or $\frac{1}{2} \times (9 + 2) \times 2 + \frac{1}{2} \times 1 \times 2$ or $11 + 1$ or 12 or $\frac{1}{2} \times 3 \times 9$ or 13.5	M1	correct attempt to estimate the full area below curve using trapezia, a trapezium and a triangle or a triangle
	Correctly evaluates $20 + 34 +$ their correct estimate for the full area below curve, which must sum to an answer which is less than or equal to 67.5	A1	M3 must be awarded

Q5. (2019)

28(b)	1	B1	
	m/s^2 or ms^{-2} or metres per second per second	B1	oe allow mps^2 or m/s/s
	Additional Guidance		
	Do not accept fractions		
	m/s^{-2}		B0