

Q1. (2017)

12	$\sqrt{64}$ or 8 or $64 = 8 \times 8$	M1	Implied by a diameter or side length of 8 stated or shown on the diagram, or radius of 4 stated or used or shown on the diagram
	$\pi \times (\text{their } 8 \div 2)^2$ or $\pi \times 4^2$ or $\pi 4^2$ or [50.24, 50.272]	M1dep	oe Allow [3.14, 3.142] for π
	16π	A1	Condone $16 \times \pi$ or $\pi \times 16$ or $\pi 16$
	Additional Guidance		
	$64 - 16\pi$		M1M1A0
	Beware of incorrect methods which lead to the correct answer eg $r = 8, 2 \times \pi \times 8 = 16\pi$ $\sqrt{64} = 8, 8^2 = 16, 16\pi$		M0M0A0 M1M0A0

Q2. (2019)

9	Alternative method 1: areas		
	$\pi \times 10^2$ or 100π	M1	implied by [314, 314.2]
	$\pi \times (8 \div 2)^2$ or $\pi \times 4^2$ or 16π or $\pi \times (8 \div 2)^2 \div 2$ or $\pi \times 4^2 \div 2$ or $16\pi \div 2$ or 8π	M1	implied by [50.2, 50.3] or [25.12, 25.14] 92 π or 84 π or 92 : 8 or 8 : 92 or 84 : 16 or 16 : 84 implies M1M1
	(their $100(\pi) - \text{their } 8(\pi)$) $\div$ their $8(\pi)$ or $92(\pi) \div 8(\pi)$ or their $100(\pi) \div$ their $8(\pi) (-1)$ or $12\frac{1}{2}(-1)$ or $12.5(-1)$	M1dep	dep on M2 absence of π must be consistent condone $16(\pi)$ as their $8(\pi)$ in first calculation only, ie condone (their $100(\pi) - \text{their } 16(\pi)$) $\div$ their $16(\pi)$ or $84(\pi) \div 16(\pi)$, but not their $100(\pi) \div$ their $16(\pi) (-1)$
	$11\frac{1}{2}$ or 11.5	A1	condone $\frac{23}{2}$
	Alternative method 2: scale factor		
	$\frac{10}{8 \div 2}$ or $\frac{10}{4}$ or $\frac{5}{2}$ or $\frac{10 \times 2}{8}$ or $\frac{20}{8}$ or 2.5	M1	oe scale factor of lengths eg $\frac{2}{5}$ or 0.4 accept 2 : 5 or 5 : 2 oe ratio π may be present, but must be consistent in numerator and denominator
	(their $\frac{5}{2}$) ² or $\frac{25}{4}$	M1dep	oe scale factor of areas eg $\frac{4}{25}$ accept 4 : 25 or 25 : 4 oe ratio
	$2 \times \text{their } \frac{25}{4}(-1)$ or $\frac{25}{2}(-1)$ or $12\frac{1}{2}(-1)$ or $12.5(-1)$	M1dep	oe eg $2 \div \text{their } \frac{4}{25}(-1)$
	$11\frac{1}{2}$ or 11.5	A1	condone $\frac{23}{2}$
	Additional Guidance is on the following page		

9 (cont)	Additional Guidance		
	Accept, for example, $\pi 8$ or $\pi \times 8$ or $8 \times \pi$ for 8π		
	An answer of 11.5π with no incorrect working		M1M1M1A0
	Consistent use of πd^2 for the area of a circle gives the area of the circle as 400π , the area of the semicircle as 32π and the area of the shaded part as 368π . This also gives the answer 11.5, but scores zero		M0M0M0A0
	Irrespective of where their answer comes from and the presence of other measures such as circumference, students can gain the first two marks of alternative method 1 if it is clear that the methods or values given are for area eg 1 Big area = 100π , little area = 8π , big circumference = 20π , little circumference = 4π , $20 \div 4 = 5$ eg 2 $100\pi, 8\pi, 20\pi, 4\pi$		M1M1M0A0 M0M0
	Do not award the second mark if the value of 8π comes from πd This is implied by, eg, 'Area of circle = 20π , area of semi-circle = 8π '		M?M0 M0M0
	$\frac{100(\pi) - 16(\pi)}{16(\pi)}$ (which may give an answer of 5.25)		M1M1M1A0
	$\frac{100(\pi)}{16(\pi)}$ (which may give an answer of 6.25)		M1M1M0A0

Q3. (2020)

Q	Answer	Mark	Comments
8	Alternative method 1		
	6.5×9 or 58.5 or 6.5×7 or 45.5	M1	oe
	$\frac{6.5 \times 9 - 2 \times 6.5}{2}$ or $\frac{58.5 - 13}{2}$ or $\frac{6.5 \times 7}{2}$ or $\frac{45.5}{2}$	M1dep	oe division may be implied eg $\frac{7}{9} = 45.5$, $\frac{3.5}{9} = 22.25$ scores M1M1
	22.75 or $\frac{91}{4}$ or $22\frac{3}{4}$	A1	oe
	Alternative method 2		
	6.5×9 or 58.5 or 6.5×4.5 or 29.25	M1	oe
	$\frac{6.5 \times 9}{2} - 6.5$ or $6.5 \times 4.5 - 6.5$	M1dep	oe eg $6.5 \times (4.5 - 1)$ or 6.5×3.5
	22.75 or $\frac{91}{4}$ or $22\frac{3}{4}$	A1	oe
Additional Guidance			
Answer 22.8 or 23 with 22.75 in working			M1M1A1
Answer 22.8 or 23 without 22.75 in working			A0

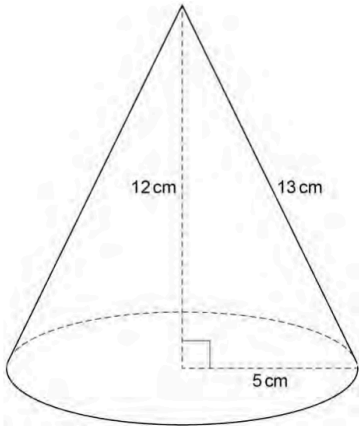
Q	Answer	Mark	Comments
11	$20^2 (\times \pi)$ or $400 (\times \pi)$ or $15^2 (\times \pi)$ or $225 (\times \pi)$	M1	oe
	$\frac{3}{4} \times 20^2 (\times \pi)$ or $300 (\times \pi)$ or $\frac{1}{3} \times 15^2 (\times \pi)$ or $75 (\times \pi)$	M1dep	oe
	$\frac{3}{4} \times 20^2 (\times \pi)$ or $300 (\times \pi)$ and $\frac{1}{3} \times 15^2 (\times \pi)$ or $75 (\times \pi)$	M1dep	
	$300 (\times \pi)$ and $75 (\times \pi)$ and 4	A1	Accept $P = 4Q$ for 4 SC2 $40 (\times \pi)$ and $30 (\times \pi)$ and $30 (\times \pi)$ and $10 (\times \pi)$ and answer 3
	Additional Guidance		
	Answer 4 with no working		M0A0
	Condone inconsistent use of π eg 300π and 75 and 4		M3A1
	Condone, for example, $\pi 400$ for 400π		
	Allow use of a numerical value for π for method marks and for the A mark with answer 4		
	Ignore units throughout		

Q5. (2023)

Q	Answer	Mark	Comments
15	True Not true Not true True	B4	B1 each correct answer
	Additional Guidance		
	Allow a cross if it's the only answer in that row		
	If one tick and one or two crosses are given in a row, mark the tick		

Q6. (2024)

7 Here is a cone.



(A)

Q	Answer	Mark	Comments
7a	Correct statement	B1	eg she used the height instead of the slant height or she used the vertical height or she used 12 (instead of 13)
	Additional Guidance		
	Check diagram		
	For 'vertical' accept anything that implies she has used the wrong height		
	Condone 'length' to mean 'height' or 'slant height'		
	12 or 13 circled on the diagram must be accompanied by a supporting statement		
	Indicates '12' in the calculation	B1	
	She should have done $\pi \times 5 \times 13$	B1	
	It should be 65π	B1	
	She used the wrong height / the (value of) π is wrong	B1	
	She hasn't used the slant height (she used the (vertical) height)	B1	
	She hasn't used the 13	B1	
	She hasn't used the 13 and should be $5 \times 12 \times 13 \times \pi$	B0	
	The multiplication used the wrong number(s)	B0	
	She hasn't used a value for π	B0	
	An incorrect statement with a correct statement eg she used 13 instead of 12 and didn't square the radius	B0	

(B)

Q	Answer	Mark	Comments
7b	$\pi \times 5 \times 5$ or 25π or $3 \times 5 \times 5$	M1	oe accept [3.14, 3.142] or $\frac{22}{7}$ for π
	75	A1	
	Additional Guidance		
	$\pi 25$		M1

(C)

Q	Answer	Mark	Comments
7c	'More than' indicated or implied by statement and valid reason	B1	eg valid reasons 3.14 is greater (than 3) Beth's number is bigger (than Adam's) (the correct answer is) 78.5 (with their answer to (b) less than 78.5)
	Additional Guidance		
	If calculations are used, the outcomes must be correct		
	Accept 78 or 79 for 78.5 unless from incorrect working		
	'Less than' indicated	B0	
	Do not penalise use of the same incorrect formula in (b) and (c) eg $3 \times 10 = 30$ in (b) and $3.14 \times 10 = 31.4$ in (c) with 'More than' ticked	B1	
	Ignore a non-contradictory reason with a correct reason eg 3.14 is bigger than 3 and nearer the true value of π	B1	
	Acceptable reasons		
	Adam has rounded (π) down / Adam only used 3	B1	
	There is an extra 0.14 to multiply by	B1	
	Her number has decimal places	B1	
	Her number is to more significant figures	B1	
	Non-acceptable reasons		
	3.14 will give a bigger answer / 3.14 is more accurate	B0	