Q1. (2018)

1	segment	B1	
	Additional Guidance		

Q2. (2021)

Q	Answer	Mark	Comments
12	**Alternative method 1** Shows algebraically that the angles are equal		
	$4x + 40$	M1	may be embedded or on the diagram
	$x + 2(2x + 20)$ or $x + 4x + 40$	M1	
	$x + 4x + 40 = 5x + 40$ and Yes	A1	
	Alternative method 2 Derives and solves an equation for angles at a point and substitutes into $5x + 40$ or $x + 2(2x + 20)$		
	$4x + 40$	M1	may be embedded or on the diagram or implied eg implied by $10x + 80 = 360$
	$x + 2(2x + 20) + 5x + 40 = 360$ or $x + 4x + 40 + 5x + 40 = 360$ or $(x =)\ 28$	M1	oe equation eg $10x + 80 = 360$ $(x =)\ 28$ may be on the diagram
	$140 + 40 = 180$ and Yes or $28 + 152 = 180$ and Yes	A1	oe must obtain $(x =)\ 28$ from one expression and substitute $(x =)\ 28$ into a different expression
	Alternative method 3 Assumes line is a diameter. Derives and solves an equation for angles on a line using $5x + 40$ and substitutes into $x + 2(2x + 20)$ or $x + 2(2x + 20) + 5x + 40$		
	$5x + 40 = 180$	M1	
	$(x =)\ (180 - 40) \div 5$ or $(x =)\ 28$	M1dep	oe $(x =)\ 28$ may be on the diagram
	$28 + 152 = 180$ and Yes or $28 + 152 + 140 + 40 = 360$ and Yes	A1	oe must obtain $(x =)\ 28$ from one expression and substitute $(x =)\ 28$ into a different expression

Mark scheme and Additional Guidance continue on next two pages

12 cont	**Alternative method 4** Assumes line is a diameter. Derives and solves an equation for angles on a line using $x + 2(2x + 20)$ and substitutes into $5x + 40$ or $x + 2(2x + 20) + 5x + 40$		
	$x + 2(2x + 20) = 180$ or $x + 4x + 40 = 180$	M1	
	$(x =)\ (180 - 40) \div 5$ or $(x =)\ 28$	M1dep	oe $(x =)\ 28$ may be on the diagram
	$140 + 40 = 180$ and Yes or $28 + 152 + 140 + 40 = 360$ and Yes	A1	oe must obtain $(x =)\ 28$ from one expression and substitute $(x =)\ 28$ into a different expression
	Alternative method 5 Assumes line is a diameter. Derives and solves two equations for angles on a line/angles at a point		
	$5x + 40 = 180$ or $x + 2(2x + 20) = 180$ or $x + 4x + 40 = 180$ or $x + 2(2x + 20) + 5x + 40 = 360$ or $x + 4x + 40 + 5x + 40 = 360$	M1	
	$(x =)\ (180 - 40) \div 5$ or $(x =)\ 28$	M1dep	oe $(x =)\ 28$ may be on the diagram
	Obtains $(x =)\ 28$ from two equations for angles on a line/ angles at a point and Yes	A1	

12 cont	**Additional Guidance**	
	Choose the scheme that favours the student	
	Up to M2 may be awarded for correct work, with no or incorrect answer, even if this is seen amongst multiple attempts	
	Correct response with other incorrect work	M1M1A0
	Alt 1 $2(2x + 20) = 4x + 20$ followed by $x + 4x + 20$ Alt 1 $x + 4x + 20$ with $2(2x + 20) = 4x + 20$ not seen Apply marks in a similar way in alts 2, 4 and 5	M0M1 M0M0
	$(x =)\ 28$	M1M1
	Allow $(x =)\ 28$ to be embedded	M1M1
	No method marks scored with a value of x ($\neq 28$) substituted into $5x + 40$ and $x + 2(2x + 20)$ giving the same value	M0M0A0
	Yes can be implied eg Alt 1 $x + 4x + 40 = 5x + 40$ and It is a diameter	M1M1A1

Q3. (2022)

Q	Answer	Mark	Comment
21	$x^2 + y^2 = 6$	B1	

Q4. (2024)

Q	Answer	Mark	Comments
1	segment	B1	region A
	sector	B1	region B