AREA OF COMPOUND SHAPES

OCR GSCE – Monday 12 November 2018 – Paper 6 (Calculator) Higher Tier

1.

12		7.17 to 7.18 or 7.2 nfww	6	**M3** for $x^2 - 3x - 30 = 0$ or **M2** for $\frac{6}{2}(10 + x) = x^2$ oe or **M1** for $\frac{6}{2}(10 + x)$ oe AND **M2FT** for $\frac{3 + \sqrt{(-3)^2 - 4 \times (-30)}}{2}$ or better or 7.17 to 7.18 and -4.18 to -4.17 or **M1FT** for either formula with at most two errors	Condone missing brackets for **M1** FT from *their* 3 term quadratic Allow **M2FT** for $\frac{3 \pm \sqrt{(-3)^2 - 4 \times (-30)}}{2}$ or better Alternative by completing the square: **M2FT** for $1.5 + \sqrt{32.25}$ or $1.5 \pm \sqrt{32.25}$ or 7.17 to 7.18 and -4.18 to -4.17 or **M1FT** for $(x - 1.5)^2 - 32.25$

AQA GSCE – Thursday 8 June 2020 – Paper 3 (Calculator) Higher Tier

2.

	0.5 × 8 × 10 × sin 114 or [36.5, 36.542]	M1	oe
	$8^2 + 10^2 - 2 \times 8 \times 10 \times \cos 114$ or [229, 229.1]	M1	oe eg $164 - 160 \times \cos 114$
	$\sqrt{8^2 + 10^2 - 2 \times 8 \times 10 \times \cos 114}$ or [15.1, 15.14] or [7.55, 7.57]	M1dep	oe dep on 2nd M1
29	0.5 × π × (0.5 × their[15.1, 15.14])² or 0.5 × π × their [7.55, 7.57]² or [89.49, 90.03]	M1dep	dep on 2nd and 3rd M1
	[125.99, 126.572]	A1	
Additional Guidance			
Diameter must come from using the cosine rule			
2nd mark is not dependent on the first			

AQA GSCE – Thursday 8 November 2018 – Paper 2 (Calculator) Higher Tier

3.

8	12×6 or 72	M1	oe area of rectangle
	$\pi \times 6^2$ or 36π or $[113, 113.112]$	M1	oe may be implied eg $\pi \times 6^2 \div 4$ or 9π or $[28.2, 28.3]$
	$\pi \times 6^2 \div 2$ or 18π or $[56.4, 56.6]$	M1dep	oe dep on 2nd M1
	$[15.4, 15.5]$ or $72 - 18\pi$	A1	

Additional Guidance	
$72 - 18\pi = 54\pi$	M1M1M1A0
$\pi \times 6^2 \div 2$ scores 2nd and 3rd M1	
$12 \times 6 = 72$ $72 \div 2 = 36$ (unless identified as half of rectangle)	(1st) M0
$\pi \times 6^2$ scores 2nd M1 even if subsequently used incorrectly eg $\pi \times 6^2 = 36\pi$ $36\pi \times 2 = 72\pi$	(2nd) M1
Ignore units throughout	

AQA GSCE – Wednesday 25 May 2017 – Paper 1 (Non - Calculator) Higher Tier

4.

12	$\sqrt{64}$ or 8 or 64 = 8 × 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
	$\pi \times$ (their 8 ÷ 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 × π or π × 16 or π16

Additional Guidance	
$64 - 16\pi$	M1M1A0
Beware of incorrect methods which lead to the correct answer eg $r = 8$, 2 × π × 8 = 16π $\sqrt{64} = 8$, $8^2 = 16$, 16π	M0M0A0 M1M0A0

AQA GSCE – Tuesday 13 June 2017 – Paper 3 (Calculator) Higher Tier

5.

26	$10(3x + 1)$ or $9x$ or $x(9 - 3x - 1)$ or $x(8 - 3x)$ or $(10 - x)(3x + 1)$ or $x(3x + 1)$ or $(10 - x)(9 - 3x - 1)$	M1	oe One correct area expression in x May be implied
	$10(3x + 1) + x(9 - 3x - 1)$ or $9x + (10 - x)(3x + 1)$ or $(10 - x)(3x + 1) + x(9 - 3x - 1)$ $+ x(3x + 1)$ or $10 \times 9 - (10 - x)(9 - 3x - 1)$	M1dep	oe Fully correct unsimplified expression for area
	$30x + 10 + 9x - 3x^2 - x$ or $9x + 30x + 10 - 3x^2 - x$ or $30x + 10 - 3x^2 - x + 9x - 3x^2 - x$ $+ 3x^2 + x$ or $90 - 90 + 30x + 10 + 9x - 3x^2 - x$ or $38x + 10 - 3x^2$	M1dep	oe dep on M1 M1 Full expansion All brackets removed
	$3x^2 - 38x + 55 (= 0)$	A1	oe 3-term equation
	$(3x - 5)(x - 11)$ $\dfrac{-38 \pm \sqrt{(-38)^2 - 4 \times 3 \times 55}}{2 \times 3}$ or $\dfrac{38 \pm \sqrt{1444 - 660}}{6}$ or $\dfrac{38 \pm \sqrt{784}}{6}$	M1	oe their 3-term quadratic factorised correctly or correct substitution in formula for their 3-term quadratic equation
	$\dfrac{5}{3}$ or $1\dfrac{2}{3}$ or 1.66(6...) or 1.67	A1	oe $x = 11$ included is A0
	Additional Guidance		
	$3x^2 = 38x - 55$		M1M1M1A1

AQA GSCE – Sample Paper 1 (Non - Calculator) Higher Tier

6.

	Alternative method 1		
	$(x+3)^2$	M1	oe
	$x^2 + 3x + 3x + 9$	A1	oe
	$3 \times (x+3)$	M1	oe
	$x^2 + 3x + 3x + 9 + 3x + 9 + 9$ $= x^2 + 9x + 27$	A1	
	Alternative method 2		
	$(x+6)(x+3)$	M1	oe
	$x^2 + 6x + 3x + 18$	A1	oe
	their $(x^2 + 6x + 3x + 18) + 3 \times 3$	M1	oe
	$x^2 + 6x + 3x + 18 + 9$ $= x^2 + 9x + 27$	A1	
12	**Alternative method 3**		
	$(x+3)^2$	M1	oe
	$x^2 + 3x + 3x + 9$	A1	oe
	$3 \times (x+6)$	M1	oe
	$x^2 + 3x + 3x + 9 + 3x + 18$ $= x^2 + 9x + 27$	A1	
	Alternative method 4		
	$(x+6)^2$	M1	oe
	$x^2 + 6x + 6x + 36$	A1	oe
	$3 \times (x+3)$	M1	oe
	$x^2 + 6x + 6x + 36 - 3x - 9$ $= x^2 + 9x + 27$	A1	

AQA GSCE – Sample Paper 2 (Calculator) Higher Tier

7.

	Alternative method 1		
	10 ÷ 4 or 2.5 or 4 ÷ 10 or 0.4 or $\frac{1}{2}$ × (18 + 10) × 25 or 350	M1	oe
	18 ÷ their 2.5 or 18 × their 0.4 or 7.2 or 25 ÷ their 2.5 or 25 × their 0.4 or 10	M1dep	oe
14(a)	$\frac{1}{2}$ × (18 + 10) × 25 or 350 and $\frac{1}{2}$ × (their 7.2 + 4) × their 10 or 56	M1dep	Must see working
	350 − 56 = 294	A1	Do not award without working seen
	Alternative method 2		
	10 ÷ 4 or 2.5 or 4 ÷ 10 or 0.4 or $\frac{1}{2}$ × (18 + 10) × 25 or 350	M1	oe
	(Area scale factor =) (their 2.5)^2 or (their 0.4)^2	M1dep	
	their 350 ÷ (their 2.5)^2 or their 350 × (their 0.4)^2 or 56	M1dep	Must see working
	350 − 56 = 294	A1	Do not award without working seen
14(b)	$\frac{18 - 10}{2}$ or 4	B1	
	$\tan x = \dfrac{25}{\text{their } 4}$	M1	
	[80.9, 81]	A1	