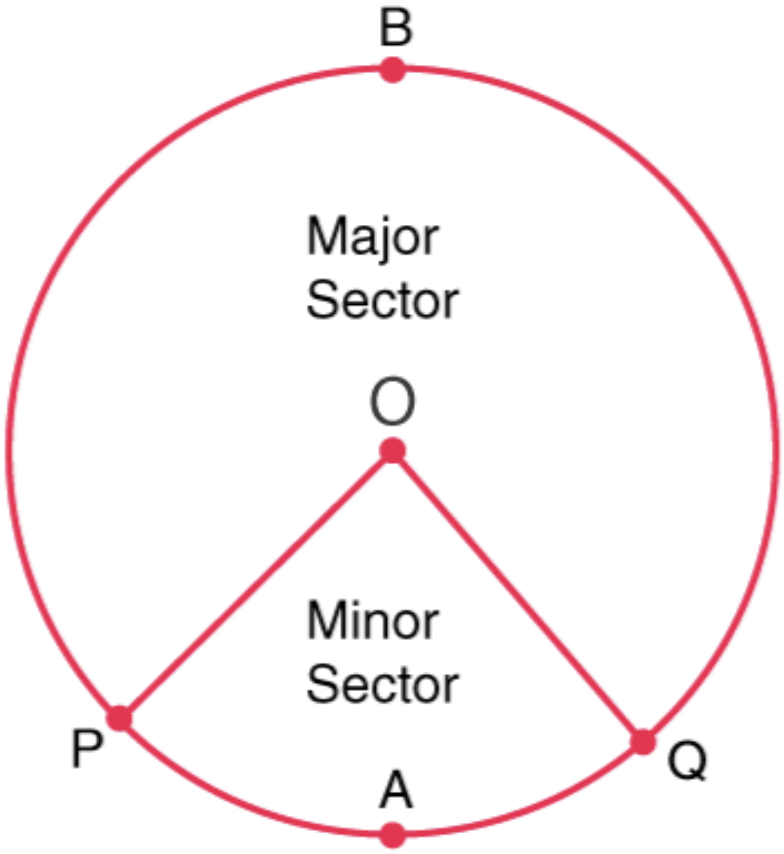
EDEXCEL IGCSE MATHEMATICS

UNIT 1 (MODULAR)

GEOMETRY – MENSURATION

QP & MS (2018 - 2025)



COMPILED BY:
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EDEXCEL IGCSE MATHEMATICS MODULAR FOR MAY & OCT 2026

by Sir Muhammad Abdullah Shah

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1. June 2025 1HR/Q25

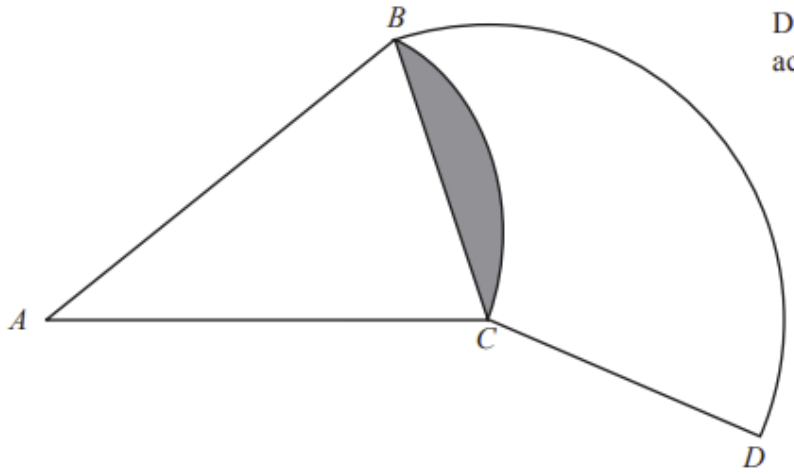


Diagram **NOT** accurately drawn

BAC is a sector of a circle, centre A

BCD is a sector of a circle, centre C

Angle $BAC = 40°$
Angle $BCD = 130°$
Area of shaded segment $= 28\,\text{cm}^2$

Find the length of the arc BD
Give your answer correct to 3 significant figures.

2. Nov 2024 1H/Q16

$OAPB$ is a sector of a circle, centre O

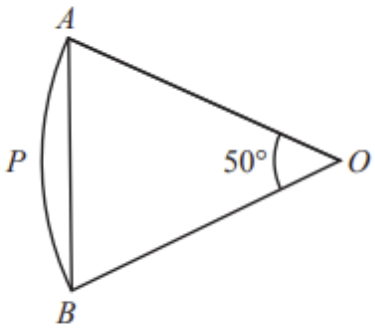


Diagram **NOT** accurately drawn

Angle $AOB = 50°$

Area of triangle $OAB = 120\ \text{cm}^2$

Work out the area of the sector $OAPB$
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 16 is 4 marks)

3. June 2024 1H/Q20

The diagram shows a sector $OABC$ of a circle centre O

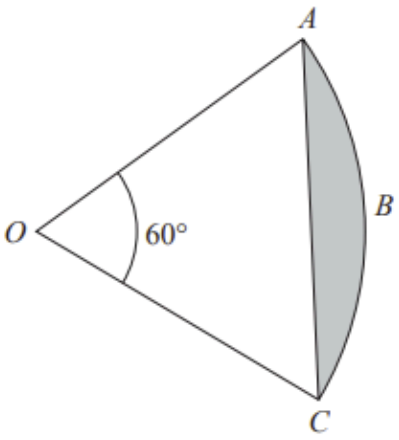


Diagram **NOT** accurately drawn

Angle $AOC = 60°$

The area of the shaded segment ABC is $38\,cm^2$

Work out the perimeter of the shaded segment ABC
Give your answer correct to one decimal place.

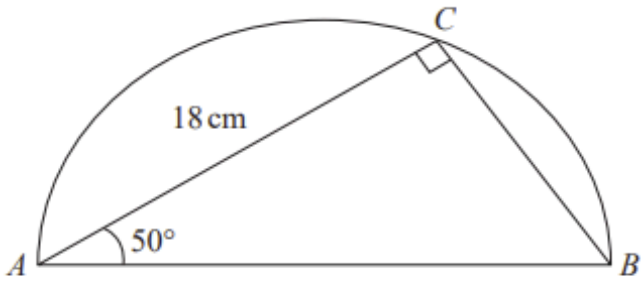
..... cm

(Total for Question 20 is 4 marks)

4. Jan 2023 1H/Q8

The diagram shows a triangle ABC inside a semicircle.

Diagram **NOT** accurately drawn



A, B and C are points on the semicircle.

AB is the diameter of the semicircle.

Angle $ACB = 90°$
Angle $BAC = 50°$
$AC = 18$ cm

Work out the perimeter of the semicircle.
Give your answer correct to 2 significant figures.

.....cm

(Total for Question 8 is 5 marks)

5. Jan 2023 1HR/Q10

R and T are points on a circle, centre O

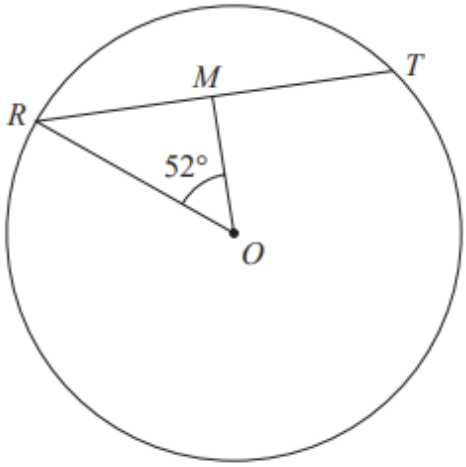


Diagram **NOT** accurately drawn

$RT = 12\,\text{cm}$
M is the midpoint of RT
Angle $ROM = 52°$

Work out the area of the circle.
Give your answer correct to 3 significant figures.

..... cm^2

(Total for Question 10 is 4 marks)

6. June 2022 1H/Q19

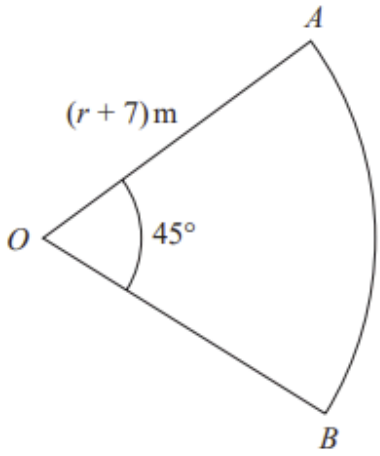


Diagram **NOT** accurately drawn

OAB is a sector **S** of a circle with centre *O* and radius $(r + 7)$ metres.
Angle $AOB = 45°$

A circle **C** has radius $(r - 2)$ metres.

The area of sector **S** is twice the area of circle **C**

Find the value of r
Show your working clearly.

$r =$ .....

(Total for Question 19 is 5 marks)

7. Jan 2022 1H/Q16

The diagram shows a circle with centre O

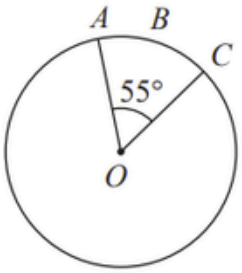


Diagram **NOT** accurately drawn

A, B and C are points on the circle so that the length of the arc ABC is 5 cm.

Given that angle $AOC = 55°$

work out the area of the circle.
Give your answer correct to one decimal place.

..... cm^2

(Total for Question 16 is 4 marks)

8. Jan 2022 1HR/Q11

The diagram shows sector OPQ of a circle, centre O

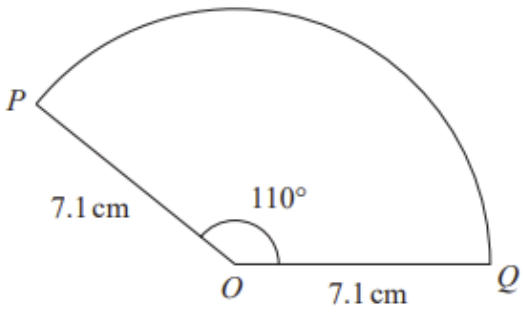


Diagram **NOT** accurately drawn

$OP = OQ = 7.1$ cm
Angle $POQ = 110°$

Calculate the area of sector OPQ
Give your answer correct to one decimal place.

..... cm^2

(Total for Question 11 is 2 marks)

..... cm^2

(Total for Question 16 is 4 marks)

9. May 2021 1H/Q12

The diagram shows a sector of a circle with radius 7 cm.

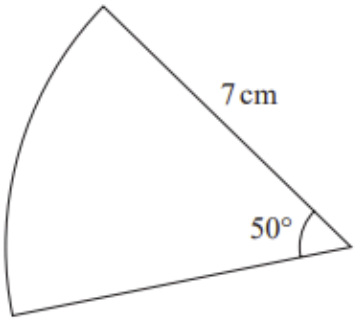


Diagram **NOT** accurately drawn

Work out the length of the arc of the sector.
Give your answer correct to one decimal place.

..... cm

(Total for Question 12 is 2 marks)

MARKING SCHEME

1. June 2025 1HR/Q25

25	eg $\frac{40}{360}\pi r^2 - \frac{1}{2}r^2 \sin 40 (= 28)$ oe **or** $\frac{40}{360}\pi r^2 = 28 + \frac{1}{2}r^2 \sin 40$ oe		6	M1	for a correct expression for the area of the shaded region Allow 3.14… or $\frac{22}{7}$ for π sin 40 = 0.64…
	(radius ^{2} =) 992 – 1024 (radius =) 31.8(096…)	31.8		A1	Allow answers in the range 31.5 – 32.0
	eg $(BC^2 =) 2\times"31.8"^2 - 2\times"31.8"^2 \cos 40 (= 473.4...)$ **or** $\frac{0.5BC}{"31.8"} = \sin 20$ **or** $\frac{BC}{\sin 40} = \frac{"31.8"}{\sin(70)}$			M1	for a correct first step to find *BC* using **their clearly identified radius** eg *r* = …. or seen on diagram NB $\frac{180-40}{2} = 70$ sin 20 = 0.34… sin 70 = 0.93… or 0.94
	eg $(BC =)\sqrt{2\times"31.8"^2 - 2\times"31.8"^2 \cos 40} (= 21.7...)$ **or** $(BC =) 2\times"31.8"\sin 20 (= 21.7...)$ **or** $BC = \frac{"31.8"\sin 40}{\sin(70)} (= 21.7...)$			M1	dep on previous M1 for a complete method to find *BC* cos 40 = 0.76… or 0.77
	eg $\frac{130}{360}\times 2\times\pi\times"21.7"$			M1	dep on previous M1 for a complete method to find the length of arc *BD*
	Correct answer scores full marks (unless from obvious incorrect working)	49.4		A1	accept 48.9 – 49.7
					Total 6 marks

2. Nov 2024 1H/Q16

16	$120 = \frac{1}{2}\times a\times b\times \sin 50$ oe or $\frac{120\times 2}{\sin 50}$ oe or $120 = \frac{1}{2}\times 2x\sin 25\times x\cos 25$ oe or $\frac{120\times 2}{2\times\sin 25\times\cos 25}$ oe or 313(.2977494)		4	M1 for a **correct** equation for $a \times b$ or r^2 (allow any letters for *a* or *b*) or for a **correct** expression for $a \times b$ or r^2 or for 313(.2977494)
	$(radius =)\sqrt{\frac{120\times 2}{\sin 50}} (= 17.7(0021891))$ oe or $(radius =)\sqrt{\frac{120\times 2}{2\times\sin 25\times\cos 25}} (= 17.7(0021891))$ oe or $(radius =)\sqrt{313(.2977494)} (= 17.7(0021891))$			M1 for a **correct** rearrangement to find the radius or for square rooting 313(.2977494) or for 17.7(0021891))
	(area of *OAPB* =) $\pi\times"17.7"^2\times\frac{50}{360}$ oe			M1
	Correct answer scores full marks (unless from obvious incorrect working)	137		A1 awrt 137
				Total 4 marks

3. June 2024 1H/Q20

20	eg $\pi r^2 \times \frac{60}{360} - \frac{1}{2} r^2 \sin 60$ oe or $\frac{\pi r^2}{6} - \frac{\sqrt{3}}{4} r^2$ oe		4	M1 for a correct expression for the area of the segment Expression may be embedded in an equation, eg $\pi r^2 \times \frac{60}{360} - \frac{1}{2} r^2 \sin 60 = 38$ or $\pi r^2 \times \frac{60}{360} = 38 + \frac{1}{2} r^2 \sin 60$ or $\pi r^2 \times \frac{60}{360} - 38 = \frac{1}{2} r^2 \sin 60$
	eg $(r^2 =) 38 \div \left(\frac{\pi}{6} - \frac{\sqrt{3}}{4}\right) (= 38 \div 0.09(058))$ (= 419(.490…)) oe or $(r =) \sqrt{38 \div \left(\frac{\pi}{6} - \frac{\sqrt{3}}{4}\right)}$ (= 20.4(81…))oe			M1 dep on M1 for a **correct** expression for r^2 or r
	$\frac{\pi}{6} \times$"20.4(81...)"$\times 2$ (= 21.4(48…)) oe or			M1 for using the value of r to find arc length
	Working not required, so correct answer scores full marks (unless from obvious incorrect working)	41.9		A1 allow 41 - 42
				Total 4 marks

4. Jan 2023 1H/Q8

8	$\cos 50 = \frac{18}{(AB)}$ or $\sin 40 = \frac{18}{(AB)}$ or $\frac{(AB)}{\sin 90} = \frac{18}{\sin 40}$		5	M1	M2 for $(AB =) \sqrt{18^2 + (18 \tan 50)^2}$ oe (= 28.0030…) or 28
	$(AB =) \frac{18}{\cos 50} (= 28.0030...)$ oe or 28 or $(AB =) \frac{18}{\sin 40} (= 28.0030...)$ oe or 28			M1	
	$\frac{1}{2} \times \pi \times$"28.0030..."$(= 43.9...)$ oe or 44 $\pi \times$"28.0030..."$(= 87.9...)$ oe or 88			M1 for use of πd or $\frac{1}{2}\pi d$ oe Allow any value of $AB > 18$ if M2 not scored	
	"28…" + "43.9…" (= 71.9900…) or "28" + "44"			M1ft from previous M1 Allow *their* d + *their* $\frac{1}{2}\pi d$	
	Correct answer scores full marks (unless from obvious incorrect working)	72		A1 awrt 72	
				Total 5 marks	

5. Jan 2023 1HR/Q10

10	$\sin 52 = \frac{12\div 2}{r}$ oe **or** $\frac{r}{\sin 90} = \frac{6}{\sin 52}$ oe **or** $\cos(90-52) = \frac{12\div 2}{r}$ oe **or** $(r^2 =)(12\div 2)^2 + \left(\frac{12\div 2}{\tan 52}\right)^2$ oe $\left[r^2 = 6^2 + 4.687...^2\right]$ **or** $\frac{r}{\sin 38} = \frac{12}{\sin 104}$ oe		4	M1	A correct trig statement for the radius use of tan must also include a correct Pythagoras statement.
	$r = \frac{6}{\sin 52}$ (=7.614) oe **or** $r = \frac{6}{\cos 38}$ oe **or** $(r =)\sqrt{(12\div 2)^2 + \left(\frac{12\div 2}{\tan 52}\right)^2}$ $\left[r = \sqrt{6^2 + 4.687...^2}\right]$ oe **or** $\frac{12\sin 38}{\sin 104}$ oe			M1	A correct method to find the radius of the circle use of tan must also use Pythagoras to find an expression for r
	(Area =) $\pi\times$("7.61...")^2			M1	the radius must come from a completely correct method
	Correct answer scores full marks (unless from obvious incorrect working)	182		A1	Accept 181 - 183
					Total 4 marks

6. June 2022 1H/Q19

19	$\pi\times(r+7)^2\times\frac{45}{360}$ oe or $(2\times)\pi\times(r-2)^2$ oe		5	M1
	$\pi\times(r+7)^2\times\frac{45}{360} = 2\times\pi\times(r-2)^2$ oe			M1 for a correct equation
	E.g. $675r^2 - 3510r + 675(=0)$ $15r^2 - 78r + 15(=0)$ oe or $5r^2 - 26r + 5(=0)$ oe Allow $5r^2 - 26r = -5$ or $[4(r-2)]^2 = (r+7)^2$ or $(r-2)^2 = \left[\frac{(r+7)}{4}\right]^2$			A1 (dep on M2) writing a correct quadratic expression in form $ax^2 + bx + c\ (=0)$ allow $ax^2 + bx = c$
	$(5r-1)(r-5)(=0)$ oe or $(r =)\ \frac{-(-26)\pm\sqrt{(-26)^2 - 4\times 5\times 5}}{2\times 5}$ or $5\left(\left(r-\frac{26}{10}\right)^2 - \left(\frac{26}{10}\right)^2\right) + 5 = 0$ oe or $4r - 8 = r + 7$ oe			M1 (dep on M1) for a complete method to solve their 3-term quadratic equation Allow one sign error and some simplification – allow as far as $\frac{26+\sqrt{676-100}}{10}$
		5		A1 dep on M2 (5 and $\frac{1}{5}$ scores M1M1A1M1A0)
				Total 5 marks

7. Jan 2022 1H/Q16

16	eg $\frac{55}{360}\times\pi\times d=5$ **or** $\frac{55}{360}\times\pi\times 2\times r=5$ oe **OR** $\frac{360}{55}\times 5(=32.7...)$ oe		4	M1	for a correct equation for the diameter **or** radius **OR** for a method to find the circumference of the circle
	eg $d=\frac{5\times 360}{55\pi}(=10.4...)$ **or** $r=\frac{5\times 360}{55\times 2\times\pi}(=5.2...)$ **OR** $d=\frac{32.7...}{\pi}(=10.4...)$ **or** $r=\frac{32.7...}{2\times\pi}(=5.2...)$			M1	for a method to work out the diameter **or** radius
	(area =) eg $\pi\times\left(\frac{"10.4..."}{2}\right)^2$ **or** $\pi\times "5.2..."^2$			M1	
		85.2		A1	allow 84.9 – 85.4
					Total 4 marks

8. Jan 2022 1HR/Q11

11	$\frac{110}{360}\times\pi\times 7.1^2$ oe or $\frac{110}{360}\times 3.14....\times 7.1^2$ oe		2	M1 for a complete method to find the area
		48.4		A1 accept 48.3 – 49.2
				Total 2 marks

9. May 2021 1H/Q12

12		$\frac{50}{360}\times\pi\times 7\times 2$ oe eg $\frac{14\pi}{36}\times 5$ **or** "43.98…"÷ 360 × 50 oe		2	M1 Students may use π or 3.14, 3.142 or $\frac{22}{7}$
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	6.1		A1 Accept answers in the range 6.05 – 6.2
					Total 2 marks