

# Past-paper walk-through

Circles, arcs and sectors ■ E5.3

eXercise

## Questions in this set

- 0580/22 N25 Q23 ■ 7 marks
- 0580/23 N25 Q19 ■ 5 marks
- 0580/42 N25 Q7 ■ 4 marks
- 0580/41 J25 Q19 ■ 4 marks

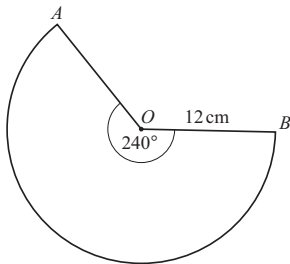
## Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

## Question 23

0580/22 N25 ■ Q23 ■ 7 marks

23

NOT TO  
SCALE

The diagram shows a major sector,  $AOB$ , of a circle.  
The sector angle is  $240^\circ$  and the radius is  $12\text{ cm}$ .

## Question 23

- (a) Show that the length of the major arc  $AB$  is  $16\pi$  cm.

## Question 23

[1]

(b)  $OA$  is joined to  $OB$  to form a cone.

Work out the volume of the cone.

Give your answer in the form  $\frac{(a\sqrt{b})\pi}{3}$  where  $a$  is an integer and  $b$  is a prime number.

## Question 23

**Question 24 is printed on the next page.**

-



## Solution 23

(a)

## Mark scheme

- 240
- 2
- 12
- 360  $\times \times \times$
- oe

## Solution 23

### (b) Mark scheme

---

- (
- )
- 256 5
- 3
- 
- cao
- 6 B5
- for answer (

## Solution 23

- )
- 256 5
- 3
- or (
- )
- 256 5
- 3
- 
- seen then spoilt
- or an answer equivalent to (

## Solution 23

- )
- 256 5
- 3
- 
- but not in required form
- OR **B2**
- for radius of cone = 8 oe
- or M1 for  $2r = 16$  **B2**
- for [height of cone =]
- 80 oe

## Solution 23

- or M1 for  $122 = \text{their } 82 + h2$  or better
- M1dep for
- 2
- 1
- 8
- 80
- 3
- their
- their
- $\times \times$

## Solution 23

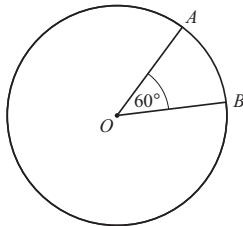
- ×
- oe
- dep on attempt at Pythagoras to find
- height of cone
- 24

$$n = \frac{4}{3} \pi r^2 h \text{ for } 33n[x] \text{ or } 34[x]$$

## Question 19

0580/23 N25 ■ Q19 ■ 5 marks

19

NOT TO  
SCALE

The diagram shows a circle, centre  $O$ , radius 12 cm.

- (a) Work out the area of the **minor** sector  $AOB$ .  
Give your answer in terms of  $\pi$  in its simplest form.

## Question 19



## Question 19

- (b) Calculate the length of the **major** arc  $AB$ .  
Give your answer in terms of  $\pi$  in its simplest form.

## Solution 19

### (a) Mark scheme

---

- 24 cao
- 2 M1 for
- 2
- 60
- 12
- $360 \times \times$
- oe

# Solution 19

## (b) Mark scheme

---

- 20 cao
- 3 M2 for 360
- 60
- 12 2
- 360
- —
- $\times \times$
- $\times$

## Solution 19

- oe
- or M1 for
- 12 2
- 360
- $k \times \times$
- $\times$
- oe
- where  $k < 360$
- 20
- 311

## Solution 19

- 990
- oe fraction
- 3 M2
- for 314.14
- 3.14
- ...—
- ... oe
- or 113
- 990
- + 198

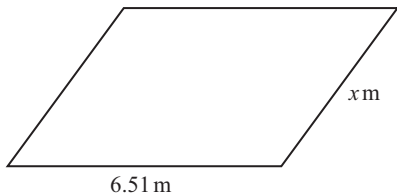
## Solution 19

- 990
- or M1 for 114.14
- 1.14
- ...—
- ... oe
- or 0.314
- or 113
- 990

## Question 7

0580/42 N25 ■ Q7 ■ 4 marks

- 7 The diagram shows a parallelogram.



NOT TO  
SCALE

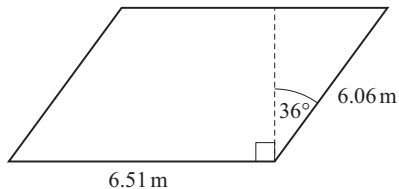
The parallelogram has the same perimeter as a circle with radius 4 m.

- (a) Show that  $x = 6.06$  m, correct to 2 decimal places.

## Question 7

[4]

(b)



NOT TO  
SCALE

The floor of a room is in the shape of this parallelogram.  
It costs \$18 per square metre to tile the floor.

Calculate the total cost of tiling the floor.



## Question 7

## Solution 7

(a)

## Mark scheme

- $2 \times \quad \times 4 = 6.51 \times 2 + 2x$
- or better **M3**
- M1 for  $2 \times \quad \times 4$  oe **M1**
- for  $6.51 \times 2 + 2x$  soi
- 6.055 to 6.058 [= 6.06]

# Solution 7

## (b) Mark scheme

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- 574 or 575
- or 574.1 to 574.5...
- 4 M2 for  $6.51 \times 6.06 \times \cos 36$  oe
- or M1 for [height = ]  $6.06 \times \cos 36$  oe seen (M1)
- for their area  $\times 18$  leading to answer
- Alternative method: (M2)
- for  $2 \times 1$
- $2 \times 6.51 \times 6.06 \times \sin(90 + 36)$  oe

## Solution 7

- or M1 for 1
- $2 \times 6.51 \times 6.06 \times \sin(90 + 36)$  oe seen **M1**
- for their area  $\times 18$  leading to answer
- 0580/42
- October/November 2025
- Partial Marks

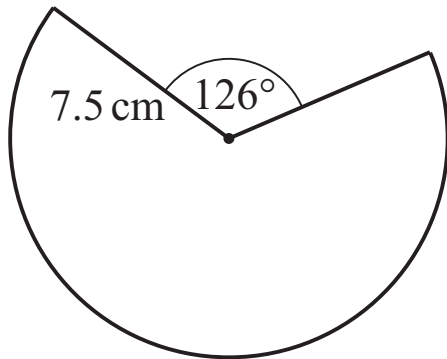
## Question 19

0580/41 J25 ■ Q19 ■ 4 marks

19 NOT TO SCALE  $126^\circ$  7.5 cm

The diagram shows a major sector of a circle with radius 7.5 cm.

Calculate the perimeter of the major sector cm [4]



# Solution 19

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- 45.6 or 45.63...
- 4 B3 for 30.6 or 30.63...
- OR M3
- for 360 126
- 360
- —
- $\times 2 \times \times 7.5 + 15$
- or M2 for 360 126

# Solution 19

- 360
- —
- $\times 2 \times \times 7.5$
- or M1 for 126
- $360 \times 2 \times \times 7.5$
- or B1 for major sector angle = 234
- 0580/41
- May/June 2025
- Partial Marks