CLASS 10 · MATHEMATICS · CHAPTER 11

Areas Related to Circles - NCERT Examples

Examples 1-2 with independently verified solutions.

CHAPTER	RESOURCE	SOURCE
Areas Related to Circles	NCERT Examples	NCERT Mathematics, Reprint 2026-27

PART 1

Verified NCERT questions and solutions

Verified NCERT questions and solutions

Solutions are checked independently and follow the supplied NCERT chapter edition.

NCERT EXAMPLE

Example 1

area of sector · major sector

Find the area of the sector of a circle with radius 4 cm and angle 30°. Also find the area of the corresponding major sector. Use π = 3.14.

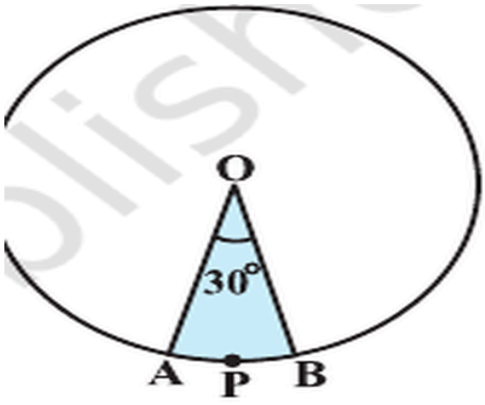

Fig. 11.5

Figure 11-5 from the supplied NCERT chapter.

Solution

Board-exam working:

Given: radius r = 4 cm and central angle θ = 30°.

Area of the minor sector:

$$A_{minor} = \frac{\theta}{360^\circ} \times \pi r^2$$

$$= \frac{30^\circ}{360^\circ} \times 3.14 \times 4^2$$

$$= \frac{1}{12} \times 3.14 \times 16$$

$$= \frac{12.56}{3} = 4.186\ldots \text{ cm}^2$$

$$A_{minor} \approx 4.19 \text{ cm}^2$$

Area of the whole circle:

$$\pi r^2 = 3.14 \times 4^2 = 50.24 \text{ cm}^2$$

Therefore, area of the corresponding major sector:

$$A_{major} = 50.24 - 4.19 = 46.05 \text{ cm}^2$$

$$A_{major} \approx 46.1 \text{ cm}^2$$

Final answer

$$A_{minor} \approx 4.19 \text{ cm}^2, \qquad A_{major} \approx 46.1 \text{ cm}^2$$

NCERT EXAMPLE

Example 2

area of segment · sector and triangle

Find the area of segment AYB shown in Figure 11.6 if the radius of the circle is 21 cm and ∠AOB = 120°. Use π = 22/7.

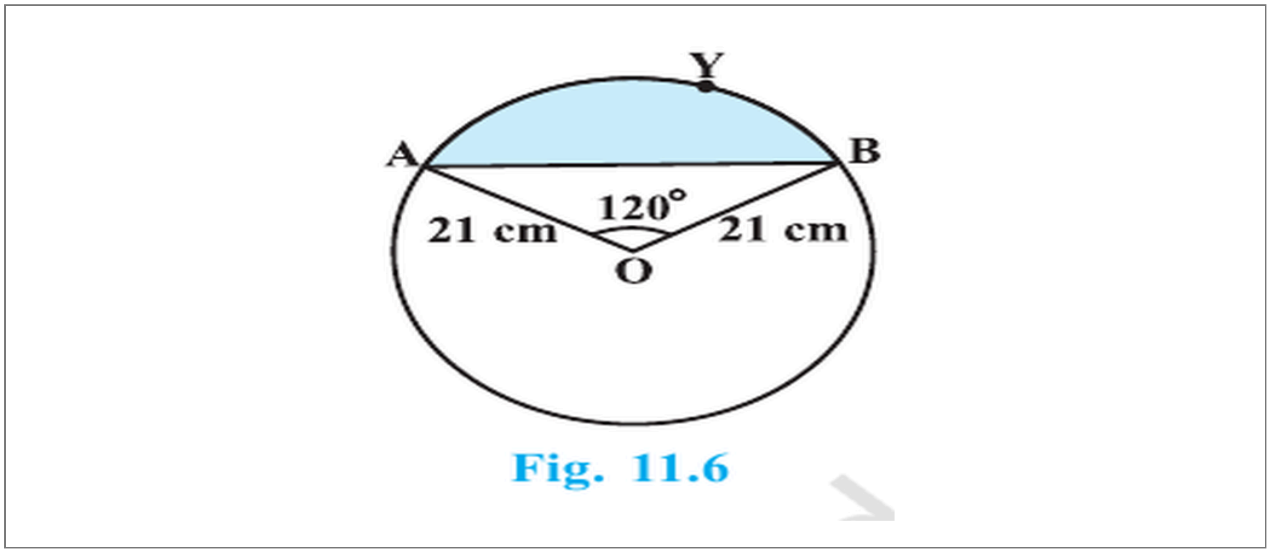

Figure 11-6 from the supplied NCERT chapter.

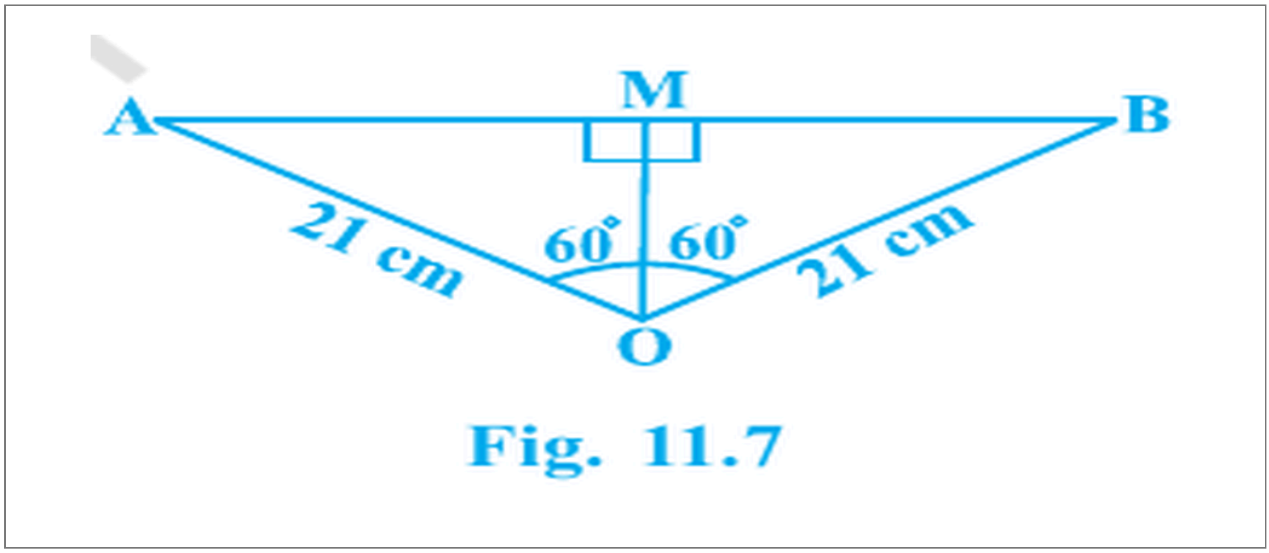

Figure 11-7 from the supplied NCERT chapter.

Solution

Board-exam working:

Area of segment AYB = area of sector OAYB − area of triangle OAB.

First, find the area of sector OAYB:

$$A_{sector} = \frac{120^\circ}{360^\circ} \times \frac{22}{7} \times 21^2$$

$$= \frac{1}{3} \times \frac{22}{7} \times 21 \times 21 = 462 \text{ cm}^2$$

Draw OM perpendicular to AB. Since OA = OB, OM bisects both AB and ∠AOB.

$$\angle AOM = \angle BOM = \frac{120^\circ}{2} = 60^\circ$$

In right triangle OMA:

$$\frac{OM}{OA} = \cos 60^\circ = \frac{1}{2}$$

$$OM = 21 \times \frac{1}{2} = \frac{21}{2} \text{ cm}$$

$$\frac{AM}{OA} = \sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$AM = 21 \times \frac{\sqrt{3}}{2} = \frac{21\sqrt{3}}{2} \text{ cm}$$

$$AB = 2AM = 21\sqrt{3} \text{ cm}$$

Now find the area of triangle OAB:

$$A_{\triangle OAB} = \frac{1}{2} \times AB \times OM$$

$$= \frac{1}{2} \times 21\sqrt{3} \times \frac{21}{2} = \frac{441\sqrt{3}}{4} \text{ cm}^2$$

Therefore:

$$A_{segment} = 462 - \frac{441\sqrt{3}}{4}$$

$$= \frac{21}{4}(88 - 21\sqrt{3})\ \text{cm}^2$$

Final answer

$$\boxed{\frac{21}{4}(88 - 21\sqrt{3})\ \text{cm}^2}$$