

MATHS

BOOKS - S CHAND MATHS (ENGLISH)

ANGLES AND ARC. LENGTHS

Exempl

1. Express (i) 1 radian, (ii) $\frac{\pi}{3}$ radians, (iii) $\frac{\pi}{15}$ radians in degrees.



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2. Express (i) 45° , (ii) 30° , (iii) 9° in radians.



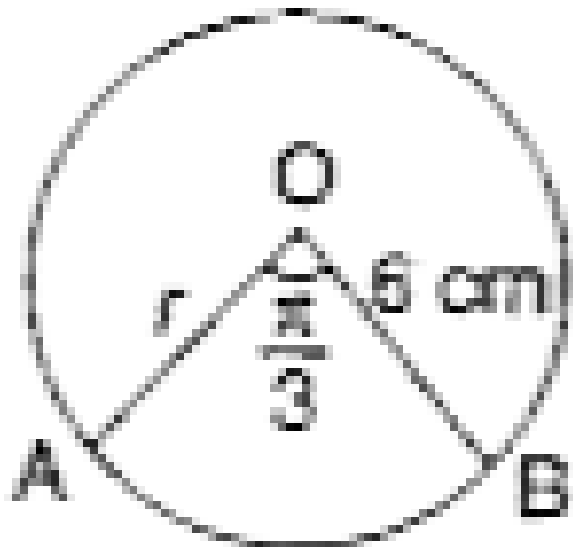
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3. Find the length of an arc of a circle of 3 cm radius if the angle subtended at the centre is 30° . ($\pi = 3.14$).



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4. What is the area of the sector shown in



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5. Taking the sun's distance as 1.4950×10^8 km and the angle subtended by the sun at a

point O on earth as half a degree, find approximately the diameter of the sun.



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6. An arc AB of a circle subtends an angle x radians at the center O of the circle. Given that the area of the sector AOB is equal to the square of the length of the arc AB , find the value of x .



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Exercise 3

1. Express the following angles in degrees :

$$\frac{\pi}{6}, \frac{14}{15}\pi, \frac{11}{18}\pi, \frac{7}{90}\pi$$



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2. Express the following angles in radians (i) 1, (ii) 20° (iii) 135°



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3. Express in radians and also in degrees the angle of a regular polygon of (1) 40 sides, (ii) n sides.



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4. The perimeter of a certain sector of a circle is equal to the length of the arc of the semi-circle having the same radius, express the angle of the sector in degrees, minutes and seconds.



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5. The length of a pendulum is 8 m while the pendulum swings through 1.5 rad, find the

length of the arc through which the tip of the pendulum passes.



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6. The minute hand of a clock is 15 cm long. How far does the tip of the hand move during 40 minutes ? (Take $\pi = 3.14$)



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7. A central angle of a circle of radius 50 cm intercepts an arc of 10 cm. Express the central angle θ in radians and in degrees.



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8. The moon's distance from the earth is 360000 km and its diameter subtends an angle of $31'$ at the eye of the observer. Find the diameter of the moon.



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9. A railway train is travelling on a curve of 750 m radius at the rate of 30 km/h, through what angle has it turned in 10 seconds ?



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10. A horse is tethered to a stake by a rope 810 cm long. If the horse moves along the circumference of a circle always keeping the rope tight, find how far it will have gone when the rope has traced out an angle of 70° ?



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11. The area of a sector is 5.024cm^2 and its angle is 36° . Find the radius. ($\pi = 3.14$)



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12. Find the area of sector of a circle of radius 5 m bounded by an arc of length 8 m.

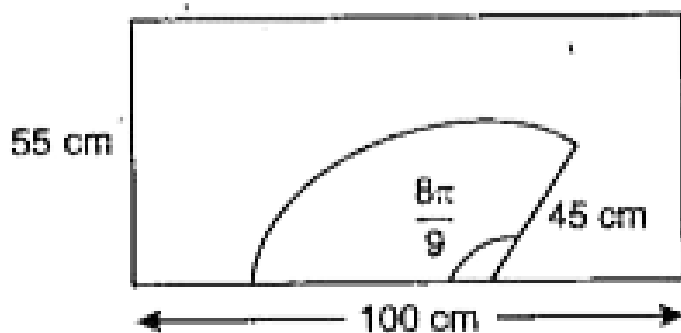


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13. The diagram shows a windscreen wiper cleaning a car windscreen.

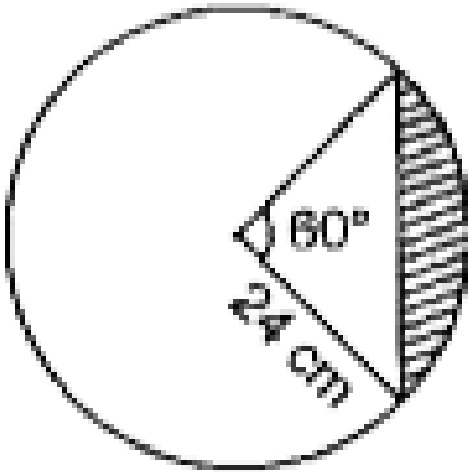
(i) What is the length of the arc swept out?

(ii) What area of the windscreen is not cleaned?



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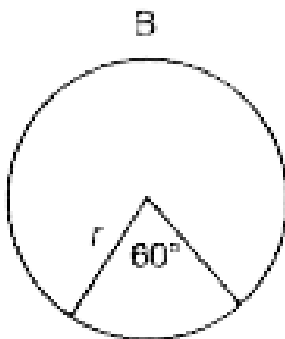
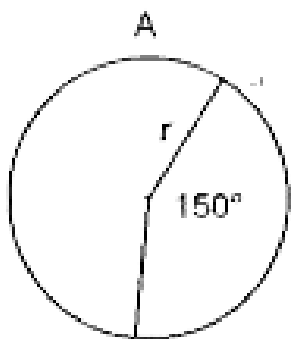
14. Find the area of the shaded segment



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15. What is the ratio of the areas of the major sector in diagram A to the minor sector in a

diagram B?



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Chapter Test

1. Find the radian measure of (i) 25° (ii) 240° .



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2. Find the degree measure of (i) $\frac{5\pi}{3}$ (ii) -4 .



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3. If an angle measures D degrees or C radians,

show that $\frac{D}{90} = \frac{2C}{\pi}$.



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4. One angle of a triangle is 54° and another

angle is $\frac{\pi}{4}$ radians. Find the third angle in

centesimal unit.



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5. Express in circular measure and also in degrees the angle of a regular octagon.



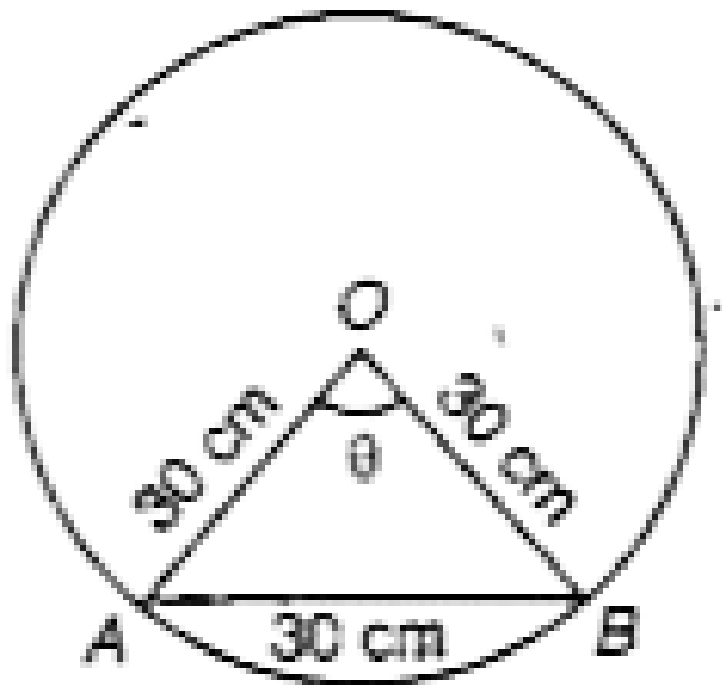
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6. If in two circles, arcs of the same length subtend angles 60° and 75° at the centre, find the ratio of their radii.



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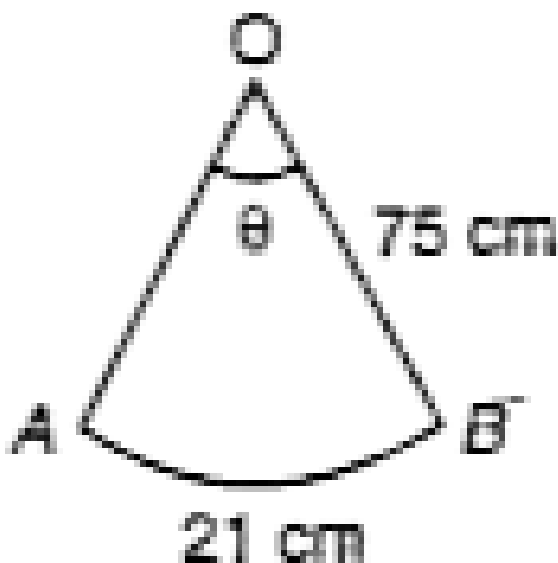
7. In a circle of diameter 60 cm the length of a chord is 30 cm. Find the length of the minor and major arcs of the chord.





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8. Find the angle in radian through which a pendulum swings and its length is 75 cm and the tip describes an arc of length 21 cm.



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9. Find the area of the sector of a circle whose radius is 14 cm and angle of sector is 45° .



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