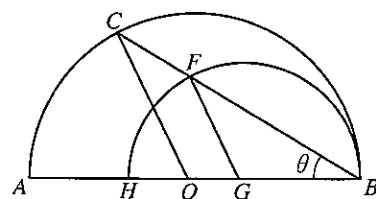**15.** The diagram shows two semicircles with centres at O and G, and radii 3 cm and 2 cm respectively. $AHOGB$ is a straight line and $\angle ABC = \theta$ radians.

    (a) Express $\angle BOC$ and $\angle BGF$ in terms of θ.

    (b) Find the ratio of the area of the sector OBC to the area of the sector GBF.

    (c) If $\theta = \dfrac{\pi}{6}$ radians, find the area of

        (i) the sector GBF,

        (ii) the region bounded by the diameter AB, the chord BC and the arc AC.

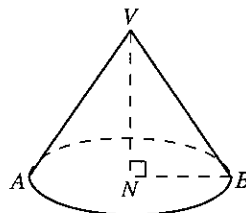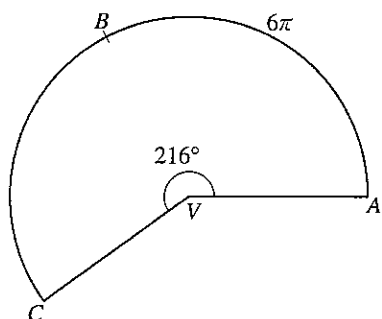**16.** In the diagram, BD is a diameter of the circle with centre O and radius 6 cm, $\angle CAD = 46°$ and $AC = AD$. Find

    (a) $\angle ADB$,

    (b) the length of the minor arc AD,

    (c) the area of $\triangle BCD$,

    (d) the area of $\triangle ACD$.
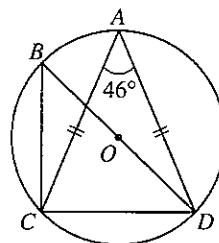
17.

In the diagram, $VABC$ is a sector of a circle with centre V, arc $ABC = 6\pi$ cm and reflex $\angle AVC = 216°$. $VABC$ is wrapped to form a cone VAB. Find

    (a) the length of VA,

    (b) the base radius of the cone VAB,

    (c) the height of the cone VAB,

    (d) the volume of the cone VAB.

18. The diagram shows a container $VABCD$ which is in the form of an inverted right square pyramid. It is given that $CD = AD = 12$ cm and the height $VN = 15$ cm. Find

    (a) the volume of the container,

    (b) the amount of water in the container if it is filled with water to half of its height,

    (c) $\angle AVC$,

    (d) the total lateral surface area of the container.