

20. 504 cones, each of diameter 3.5 cm and height 3 cm, are melted and recast into a metallic sphere, Find the diameter of the sphere and hence find its surface area.

[Use $\pi = \frac{22}{7}$]

SECTION D

Question numbers 21 to 31 carry 4 marks each.

21. The diagonal of a rectangular field is 16 metres more than the shorter side. If the longer side is 14 metres more than the shorter side, then find the lengths of the sides of the field.
22. Find the 60th term of the AP 8, 10, 12,, if it has a total of 60 terms and hence find the sum of its last 10 terms.
23. A train travels at a certain average speed for a distance of 54 km and then travels a distance of 63 km at an average speed of 6 km/h more than the first speed. If it takes 3 hours to complete the total journey, what is its first speed?
24. Prove that the lengths of the tangents drawn from an external point to a circle are equal.
25. Prove that the tangent drawn at the mid-point of an arc of a circle is parallel to the chord joining the end points of the arc.
26. Construct a ΔABC in which $AB = 6$ cm, $\angle A = 30^\circ$ and $\angle B = 60^\circ$, Construct another $\Delta AB'C'$ similar to ΔABC with base $AB' = 8$ cm.
27. At a point A, 20 metres above the level of water in a lake, the angle of elevation of a cloud is 30° . The angle of depression of the reflection of the cloud in the lake, at a A is 60° . Find the distance of the cloud from A.
28. A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is
- a card of spade or an ace.
 - a black king.
 - neither a jack nor a king
 - either a king or a queen.
29. Find the values of k so that the area of the triangle with vertices (1, -1), (-4, 2k) and (-k, -5) is 24 sq. units.