

## Questions with Answer Keys

MathonGo

Q1 (25 July 2021 Shift 1)

A spherical gas balloon of radius 16 meter subtends an angle  $60^\circ$  at the eye of the observer A while the angle of elevation of its center from the eye of A is  $75^\circ$ . Then the height (in meter) of the top most point of the balloon from the level of the observer's eye is:

(1)  $8(2 + 2\sqrt{3} + \sqrt{2})$

(2)  $8(\sqrt{6} + \sqrt{2} + 2)$

(3)  $8(\sqrt{2} + 2 + \sqrt{3})$

(4)  $8(\sqrt{6} - \sqrt{2} + 2)$

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## Heights and Distances

JEE Main 2021 (July) Chapter-wise Questions

## **Questions with Answer Keys**

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Answer Key

## Q1 (2)

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## Hints and Solutions

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O → centre of sphere

P, Q → point of contact of tangents from A

Let T be top most point of balloon & R be foot of perpendicular from O to ground.

From triangle OAP, OA = 16 cosec 30° = 32

From triangle ABO, OR = OA sin 75° =  $32 \frac{(\sqrt{3}+1)}{2\sqrt{2}}$

So level of top most point = OR + OT

$= 8(\sqrt{6} + \sqrt{2} + 2)$

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