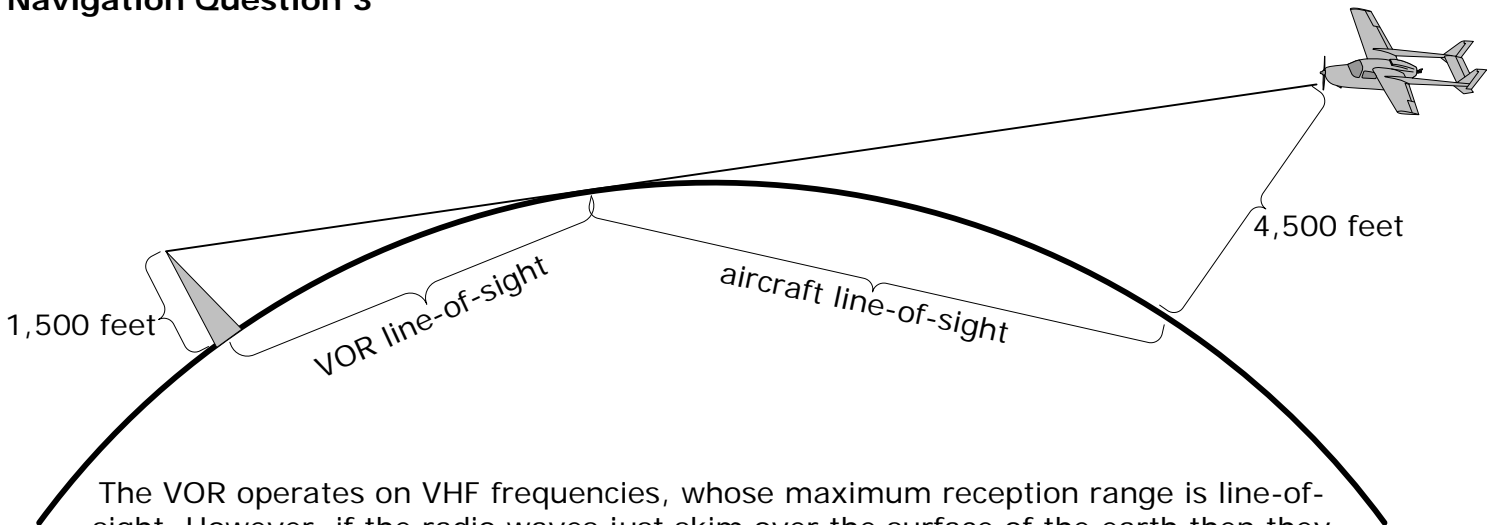


## Commercial Pilot Exam Prep. Guide

### Navigation Question 3



The VOR operates on VHF frequencies, whose maximum reception range is line-of-sight. However, if the radio waves just skim over the surface of the earth then they continue to propagate as shown in the diagram above.

This means that you need to calculate the maximum line-of-sight distance from the VOR, and add to it the maximum line-of-sight distance from the aircraft (using the normal formula). This is shown below;

$$\begin{aligned}\text{VOR\_line -of -sight} &= 1.23 \times \sqrt{\text{VOR\_height}} \\ &= 1.23 \times \sqrt{1,500 \text{ feet}} \\ &= 47.6 \text{ nm}\end{aligned}$$

$$\begin{aligned}\text{aircraft\_line -of -sight} &= 1.23 \times \sqrt{\text{VOR\_height}} \\ &= 1.23 \times \sqrt{4,500 \text{ feet}} \\ &= 82.5 \text{ nm}\end{aligned}$$

$$\text{max\_reception\_distance} = 47.6\text{nm} + 82.5\text{nm} = 130.1\text{nm}$$

The correct answer is c) 130nm