

NEXT-TIME QUESTION

Suppose at a concert a singer's voice is radio broadcast all the way around the world before reaching the radio you hold to your ear. This takes $1/8$ second. If you're close, you hear her voice in air before you hear it from the radio. But if you are far enough away, both signals will reach you at the same time.



How many meters distant must you be for this to occur?



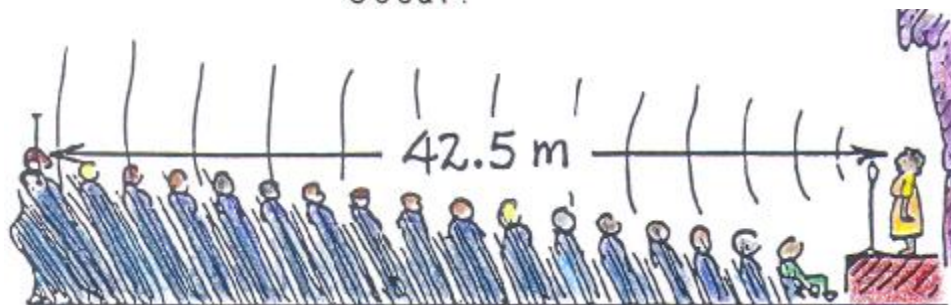
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Answer:



If you sit 42.5 meters away from the singer, both the sound from the radio that is broadcast all the way around the world and that through the air will reach you in the same $1/8$ second. Distance in air = speed of sound \times time in air
 $= 340 \text{ m/s} \times 1/8 \text{ s} = 42.5 \text{ m}$

If you sit farther back, you'll hear the radio signal before you hear the sound signal!