

If a satellite in a circular orbit at a height of two earth radii is to be made geosynchronous, its speed must be adjusted to make the period become exactly 24 hours. This statement is:

1. True
2. False
3. The task is impossible.
4. None of the above.

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True

False

Impossible

None of the above

The correct answer is #3, because

- The period of any earth satellite in circular orbit is fixed by the radius of its orbit (or equivalently by its height above the earth's surface). Therefore it is impossible to make a satellite geosynchronous if it is at a height of two earth radii.

Indeed, its speed is not even adjustable, but is in fact entirely determined by the height of its circular orbit. (Recall that in class we calculated that any geosynchronous satellite must have an altitude of about 5.6 earth radii.)