

**Round: 9B**  
**Category: Physical**  
**Time: 5 minutes**

The Equilibrium Theory of Tides says that tidal potential can be determined solely by celestial mechanics.

1. What are the three main assumptions of the Equilibrium Theory of Tides? (9 pts)

2. a. For the diagram below, draw in the tidal bulges. (5 pts)



b. Briefly explain in terms of acceleration relative to Earth what is happening to cause each tidal bulge. (6 pts)

ANSWER

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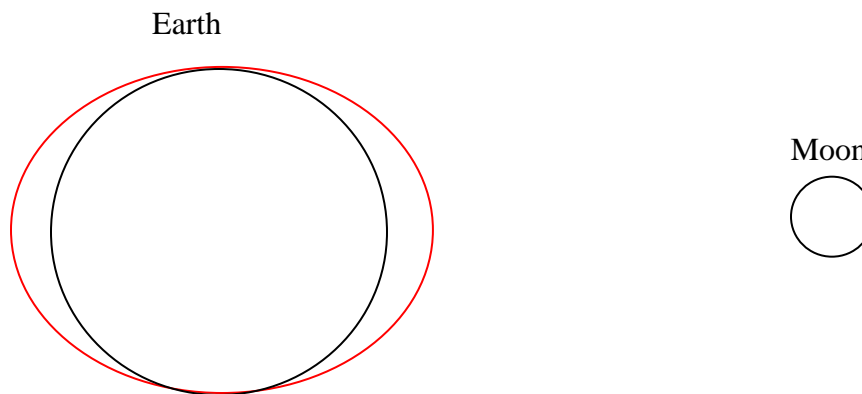
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The Equilibrium Theory of Tides says that tidal potential can be determined solely by celestial mechanics.

1. What are the three main assumptions of the Equilibrium Theory of Tides?

1. An ocean of uniform depth covers Earth (3 pts)
2. No fluid friction (3 pts)
3. No Coriolis Effect (3 pts)

2. a. For the diagram below, draw in the tidal bulges.  
(red circle indicates tidal bulge- 5 pts)



b. Briefly explain, in terms of acceleration relative to Earth, what is happening to cause each tidal bulge.

The bulge nearest the moon is being pulled toward the moon with more force than the center of the Earth, so relative acceleration is toward the moon (3 pts).

The center of the Earth is being pulled toward the moon with more force than the bulge distant to the moon, so relative acceleration is away from the moon (3 pts).