Formative Assessment

1. What is the force of gravity between the Philae probe with a mass of 100. kg and comet 67P with a mass of 1.05×10^{13} kg if the probe is resting on the surface of the 2.05 km radius comet. (That we will pretend is spherical - it's highly not) (0.0167 N)

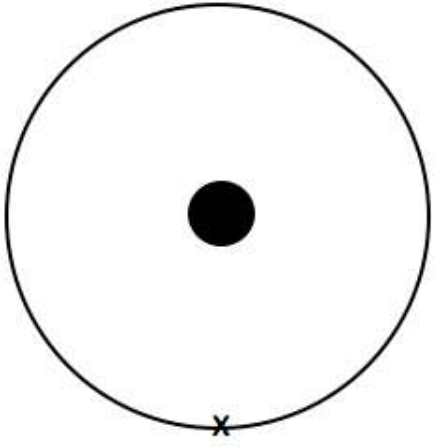
2. What distance needs to separate the centers of two 5.20 kg spheres so that the force of gravity between them is 1.20×10^{-9} N (1.23 m)

3. Your 12,500 kg spaceship is orbiting 1.16×10^7 m from the center of a planet every 17,500 s. What is the mass of the planet? (3.02×10^{24} kg)

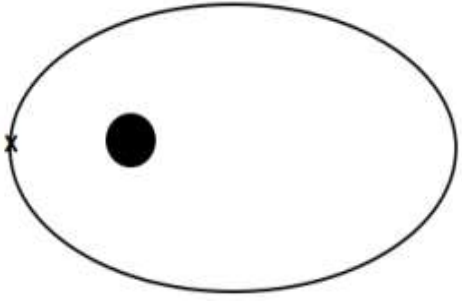
4. At what distance from the center of our 7.35×10^{22} kg moon is the orbital velocity 340. m/s? (4.24×10^{7} m)

5. Draw the new orbit: (Circle or oval indicates your current orbit)

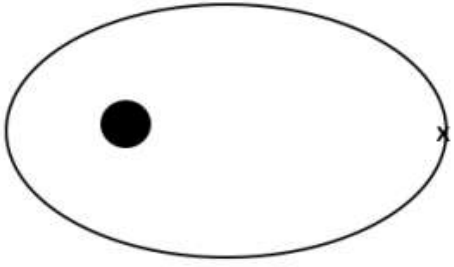
Slow at x:



Speed up at x:



Speed up at x:



1. a. What is the force of gravity between a 6.50×10^{16} kg asteroid and a 18,700 kg spaceship if their centers are 1,450 m distant?

38,600 N

b. The centers of two lead spheres are separated by 6.70 m. If one sphere has a mass of 56.0 kg, and there is an attractive force of 3.70×10^{-9} N, what is the mass of the other sphere?

44.5 kg

c. You are orbiting the planet Qwrmczl at a radius of 1.45×10^7 m, at a velocity of 3410 m/s. What is its mass?

2.53×10^{24} kg

d. What is the period of an orbit that is 3.90×10^8 m from earth's center? (m = 5.97×10^{24} kg)

2.43×10^6 s

2. a. What is the force of gravity between a 2.60×10^{13} kg asteroid and a 56,100 kg spaceship if their centers are 3,560 m distant?

7.68 N

b. What distance separates the centers of two lead spheres if one has a mass of 123 kg, the other a mass of 12.0 kg and there is an attractive force of 3.20×10^{-12} N?

175 m

c. You are orbiting the planet Wnnydrydrl at a radius of 7.80×10^6 m, and a period of 2.30×10^4 seconds. What is the planet's mass?

5.31×10^{23} kg

d. What is the radius of an orbit around earth ($m = 5.97 \times 10^{24}$ kg) that has an orbital velocity of 27.2 m/s?

5.38×10^{11} m

question

answer

question

answer