

Orbit and Gravity Questions from SA7.3

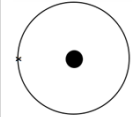
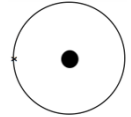
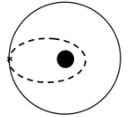
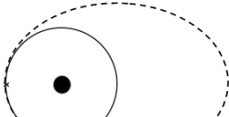
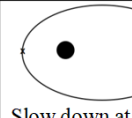
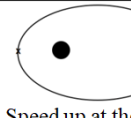
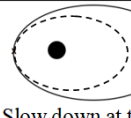
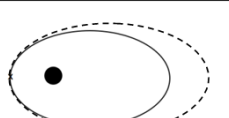
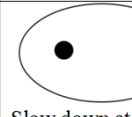
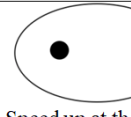
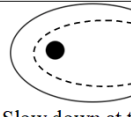
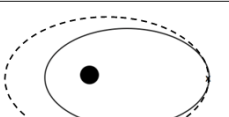
Use the value of $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$

38,600 N 44.5 kg 2.53×10^{24} kg 2.43×10^6 s	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? 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? 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? d. What is the period of an orbit that is 3.90×10^8 m from earth's center? ($m = 5.97 \times 10^{24}$ kg)
7.68 N 175 m 5.31×10^{23} kg 5.38×10^{11} m	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? 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? c. You are orbiting the planet Wnnydrydr1 at a radius of 7.80×10^6 m, and a period of 2.30×10^4 seconds. What is the planet's mass? 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?
3,980 N 2.84 kg 2.51×10^8 m 4.89×10^5 s	3. a. What is the force of gravity between a 2.10×10^{15} kg asteroid and a 23,800 kg spaceship if their centers are 915 m distant? b. The centers of two lead spheres are separated by 1.35 m. If one sphere has a mass of 125 kg, and there is an attractive force of 1.30×10^{-8} N, what is the mass of the other sphere? c. What is the radius of the orbit that has an orbital velocity of 1260 m/s around the earth? ($m = 5.97 \times 10^{24}$ kg) d. What is the period of an orbit with a radius of 3.10×10^7 m around the moon? (Moon's mass is 7.36×10^{22} kg)
72.4 N 1.67 m 2.92×10^5 s 7.54×10^{25} kg	4. a. What is the force of gravity between a 2.30×10^{14} kg asteroid and a 12,700 kg spaceship if their centers are 1,640 m distant? b. What distance separates the centers of two lead spheres if one has a mass of 215 kg, the other a mass of 125 kg and there is an attractive force of 6.40×10^{-7} N? c. What is the period of the orbit that has a radius of 9.50×10^7 m around the earth? ($m = 5.97 \times 10^{24}$ kg) d. You orbit the planet Kssnndnnwrr at a radius of 8.20×10^7 m with a velocity of 7830 m/s. What is its mass?
40.0 N 9.60 kg 986 m/s 2.15×10^{23} kg	5. a. What is the force of gravity between a 23.6×10^{12} kg asteroid and a 14,600 kg spaceship if their centers are 758 m distant? b. The centers of two lead spheres are separated by 4.90 m. If one sphere has a mass of 45.0 kg, and there is an attractive force of 1.20×10^{-9} N, what is the mass of the other sphere? c. What is the velocity of the orbit that has a radius of 4.10×10^8 m around the earth? ($m = 5.97 \times 10^{24}$ kg) d. You are in an orbit with a radius of 8.50×10^7 m and a period of 1.30×10^6 s around the planet Rjxnstdnrr. What is its mass?

e.

Questions:

Answers:

 Slow down at the x:	 Speed up at the x:	 Slow down at the x:	 Speed up at the x:
 Slow down at the x:	 Speed up at the x:	 Slow down at the x:	 Speed up at the x:
 Slow down at the x:	 Speed up at the x:	 Slow down at the x:	 Speed up at the x:

In general, speeding up brings the far side out, slowing down brings the far side in. Speeding up brings the entire trajectory outside the old one, and slowing down brings entire trajectory inside the old one.