## **Extra Practice Problems for Circular Motion and Gravity**

1 sticker if you do all 4 problems, 1 more sticker if you can solve the challenge problem ©

- Your pig (mass 532 grams) is flying in a circle with a radius of 1.4 meters.
  a. If he goes around 5 times in 15 seconds, what is his speed? (2.93 m/s)
  - b. What is the centripetal force acting on him? (3.27 N)
- 2. Calculate the force of attraction between you (mass 63 kg) and your large cat (**44 pounds**) if you are 1.2 meters apart. (5.84 x 10<sup>-8</sup> N)



- 3. How far away from the center of the earth (r) would you (100 kg) need to go in order for the acceleration due to gravity to be equal to 4.9 m/s<sup>2</sup>? What would your weight be there? How many g's would you feel? (9.02 x 10<sup>6</sup> m, 490 N, 0.5 g's)
- 4. A satellite for AT&T is orbiting at 820,000 m above the surface of the earth. Calculate how fast it is traveling. (*Hint:* You will need to find g at that altitude first.) (7,450 m/s)

## CHALLENGE PROBLEM

## There will not be one like this on your quiz. Yes, it is solvable. 🕲

In our video clip from a while back it said the Vomit Comet is actually free-falling around the earth at 17,000 miles per hour. Calculate how far **above the earth's surface in miles** they are. (335 miles) HINT: set your 2 equations for g equal to each other

