$\qquad$ Hour $\qquad$

## 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 $\odot$

1. 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? $(2.93 \mathrm{~m} / \mathrm{s})$
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. $\left(5.84 \times 10^{-8} \mathrm{~N}\right)$
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 $4.9 \mathrm{~m} / \mathrm{s}^{2}$ ? What would your weight be there? How many g's would you feel? ( $9.02 \times 10^{6} \mathrm{~m}, 490 \mathrm{~N}, 0.5 \mathrm{~g}$ 's)
4. A satellite for AT\&T is orbiting at $820,000 \mathrm{~m}$ above the surface of the earth. Calculate how fast it is traveling. (Hint: You will need to find $g$ at that altitude first.) $(7,450 \mathrm{~m} / \mathrm{s})$

