**A little bit of everything Quiz ;)**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_\_\_\_\_Period: \_\_\_\_\_\_\_\_\_

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| --- | --- | --- | --- |
| **Centripetal Acceleration**$a\_{c}=\frac{v^{2}}{r}=\frac{4π^{2}r}{T^{2}}$  | **Centripetal Force**$F\_{C}=ma\_{c}$  | **Velocity**$$v=\frac{d}{t}=\frac{2πr}{T}$$ | **Universal Gravitation**$$F\_{G}=\frac{Gm\_{1}m\_{2}}{r^{2}}$$G=6.67x10-11 |
| **Work**W=FdW=ΔK= KF-KiW=ΔU= UF-Ui | **Power**$$P=\frac{W}{t}$$ | **Kinetic Energy**$$K=\frac{1}{2}mv^{2}$$ | **Potential Energy**U=mgh$$U=\frac{1}{2}kx^{2}$$ |
| **Total Mechanical Energy** TE= K + U |
| **Conservation of Energy**  TEi= TEf |

I. Answer the following. Include all your work to get full credit.

1. A 12kg block is pushed up a ramp as shown. How much potential energy does it have when it reaches the top? \_\_\_\_\_\_\_\_\_\_\_\_

13m

6.5m



2. A 1300kg car traveling at 45km/h hits the brakes and comes to a stop in 24m. How much work is done on the car?

 \_\_\_\_\_\_\_\_\_\_\_\_

3. A 15N baseball has 650J of kinetic energy. How fast is it moving? \_\_\_\_\_\_\_\_\_\_\_\_

4. A 8kg box is sliding across the floor at 4m/s when it is accelerated to 15m/s in 6s. If the coefficient of friction is 0.30, How much power is required to accelerate the box? \_\_\_\_\_\_\_\_\_\_\_\_

5. If the gravitational force between objects of equal mass is 2.30x10‐8 N when the objects are 10.0m apart, what is the mass of each object? \_\_\_\_\_\_\_\_\_\_\_\_

6. A 10,500lb airplane is moving on a circular path of radius 4.5 km. If it completes 6 complete cycles in 3.5min, calculate:

a. centripetal acceleration in m/s2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b. centripetal force [1kg=2.2lb] \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

