

# Motion in Two Dimensions

## Chpt 7 rev 4

1. A bullet is fired horizontally at a speed of 235 m/s from a height of 1.3 m from the ground. A) How long does it take to hit the floor?...b) How far does it go?
2. A baseball is hit at an angle of  $43.0^\circ$  at a speed of 25.6 m/s. a) How long is it in the air? B) How high does it go? C) How far does it go?
3. A 54.0 kg runner rounds a corner, with a 47.9 m radius, at a speed of 15.0 km/hr. a) What is the acceleration of the runner? B) What force is necessary for this acceleration? C) What would  $\mu$  be if friction was producing the  $F_c$ ?
4. Another 54.0 kg student (this one a lippy one)a is swung in an horizontal circle of radius 4.30 m with a period of 2.70 s. a) What speed (velocity) is the person moving at? B) What acceleration does she have? C) What force is needed to do this?
5. What is the period of a rotating mass if it has a velocity of 22 rpm's and a radius of 2.3 m?
6. A 25.0 g clump of dirt is stuck to a 34.0 cm flywheel (that's its diameter) that is turning at 650 rpm's. a) What velocity is the dirt moving? B) What acceleration does it have? C) What force keeps it in circular motion?...give it's size!
7. Two wires hold up a 44.0 kg sign. What force does each wire exert if....
8. What is  $\mu$  if a 22 kg box is pulled across a floor by a force of 120 N applied  $33^\circ$  above the horizontal as it's acceleration is  $1.3 \text{ m/s}^2$ ?
9. What speed does a rocket travel if it is  $2.2 \times 10^7 \text{ m}$  from the center of the earth and has a period of 0.25 days?...What is its centripetal acceleration?.....What is the centripetal force if it is 1200 kg?
10. Jonny runs around a 44.0 m radius circular track in 1.2 minutes. What is his velocity?...His centripetal acceleration?...His centripetal force if he is 66 kg?.... $\mu$  if the centripetal force is caused by the friction force?

