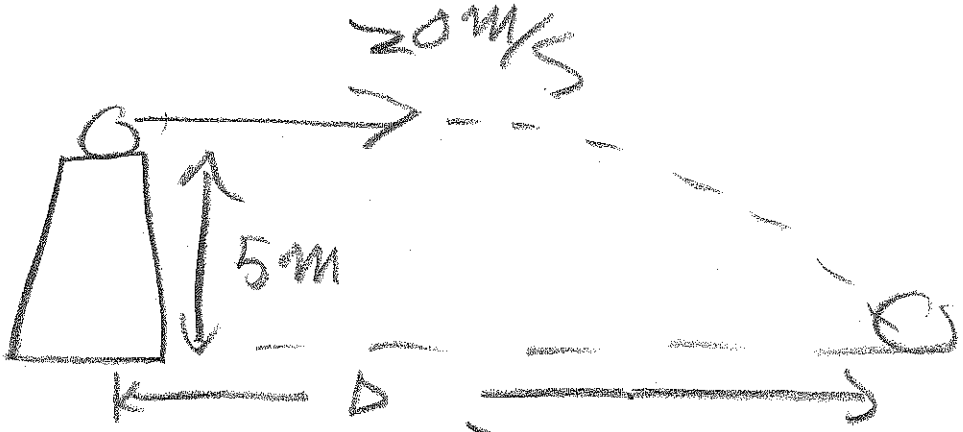
CH 6

Projectile motion: see simulation Lab 2 and pp 172-178




$5\,m = \frac{1}{2} g t^2 \Rightarrow t = 1\ second$

$D = \left(20 \frac{m}{s}\right) \cdot (1\,s) = 20\,m$

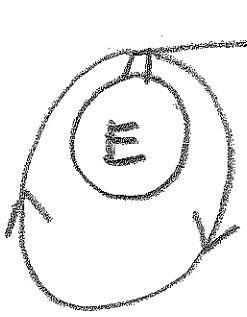
# Fast moving Projectiles

BALL LAUNCHED FROM 5m TALL TOWER.


ORBIT (CIRCULAR)

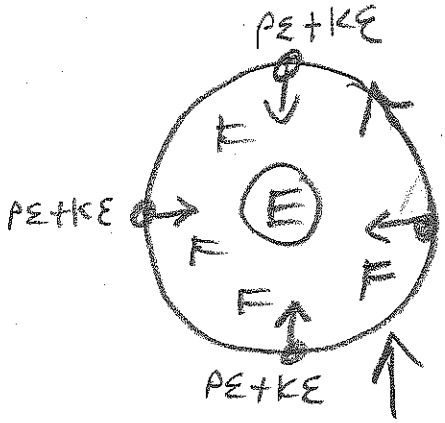
IF $V < 8000$ m/s BALL CRASHES


IF $V > 8000$ m/s, BALL HAS ELLIPTICAL ORBIT.




see fig 10.28

# elliptical orbits and energy conservation




CIRCULAR ORBIT

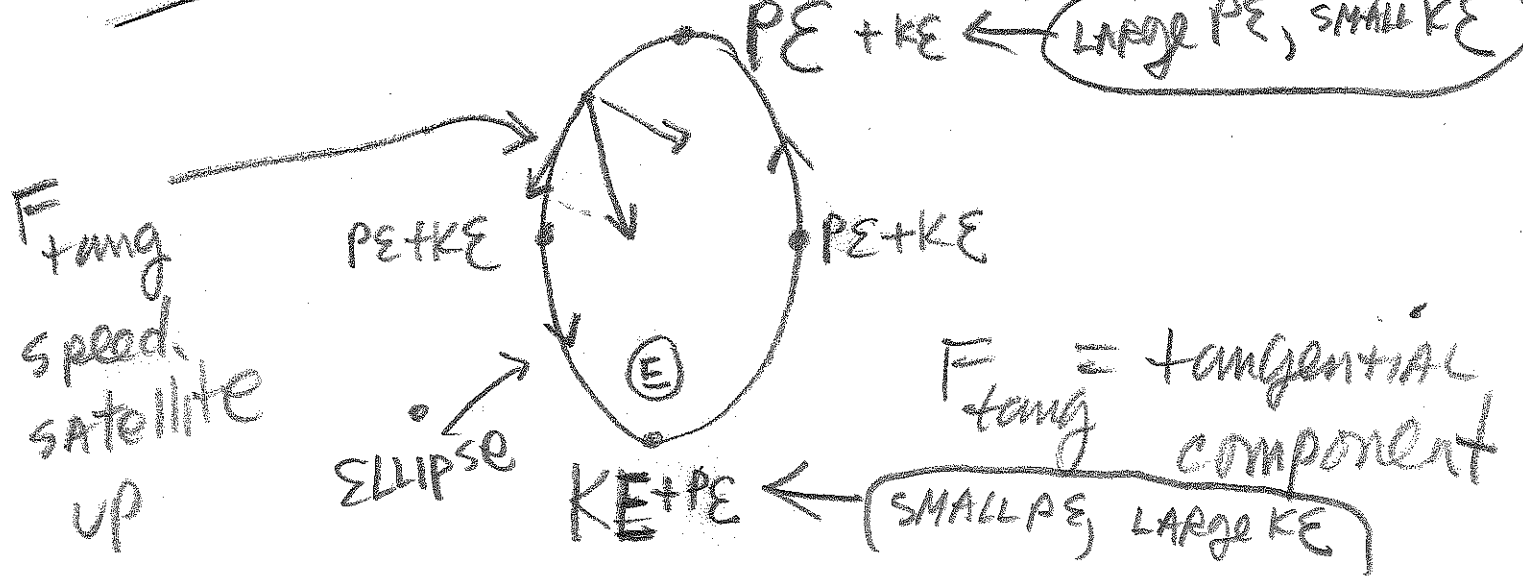
Force is perpendicular to circle and DOES NO WORK. THUS speed is CONSTANT and

$KE = \frac{1}{2} m v^2$

is CONSTANT.

PE = CONSTANT ALSO.

## ELLIPTICAL ORBIT



# Escape speed

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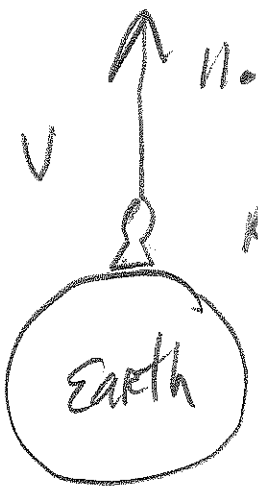
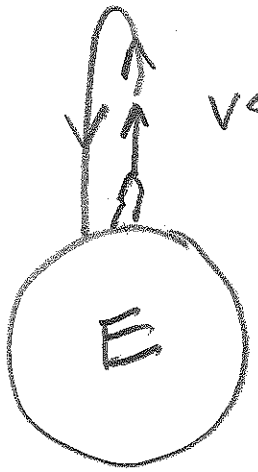



$11.2 \frac{km}{s} = 11200 \frac{m}{s}$

rocket will NOT return if $V \geq 11.2 \frac{km}{s}$




$V < 11.2 \frac{km}{s}$

rocket returns if $V < 11.2 \frac{km}{s}$.