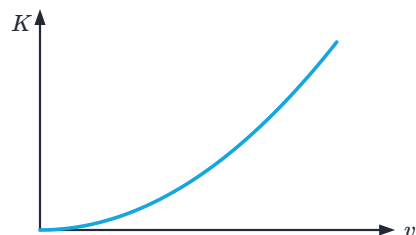
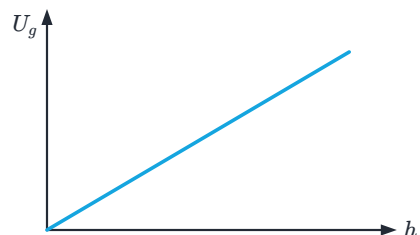


Kinetic energy vs velocity



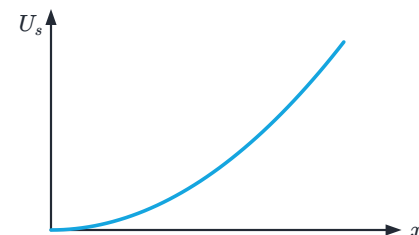
- ✓ $K = \frac{1}{2}mv^2$
- ✓ Parabola opening upward
- ✓ Double $v \rightarrow$ quadruple K

Gravitational PE vs height



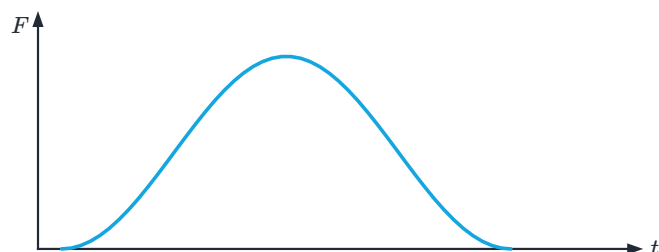
- ✓ $U_g = mgh$
- ✓ Straight line
- ✓ Slope = mg (weight)

Elastic PE vs stretch



- ✓ $U_s = \frac{1}{2}kx^2$
- ✓ Parabola opening upward

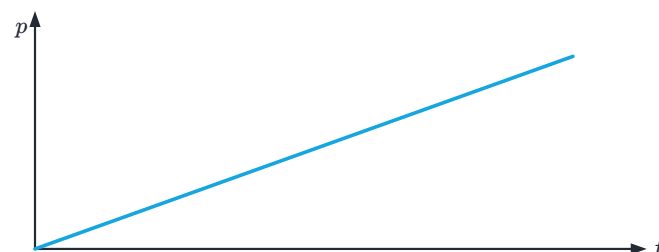
Force vs time



- ✓ Area under curve = impulse, J

$$J = \Delta p = \int F dt$$

Momentum vs time



- ✓ Slope = net force

$$\text{slope} = \frac{\Delta p}{\Delta t} = F_{\text{net}}$$

What slope and area mean

Graph	Slope represents	Area represents
Position—time ($x-t$)	Velocity	—
Velocity—time ($v-t$)	Acceleration	Displacement
Acceleration—time ($a-t$)	—	Change in velocity (Δv)
Force—time ($F-t$)	—	Impulse (Δp)
Momentum—time ($p-t$)	Net force	—
Force—stretch ($F-x$)	Spring constant (k)	Elastic potential energy
Potential energy—height (U_g-h)	Weight (mg)	—