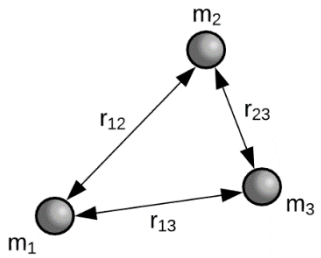
CONCEPT: Gravitational Potential Energy in a System of Masses

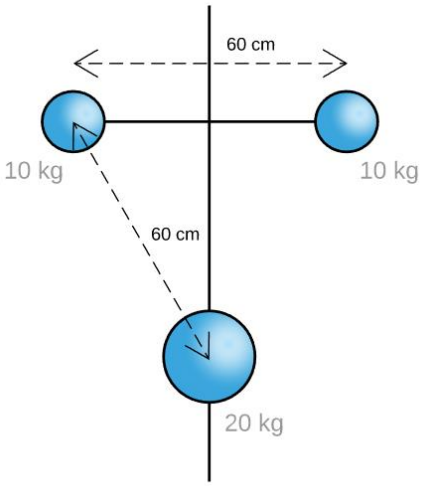
● To find *total* Grav. Potential Energy in a system of masses, simply add energies for _____.

- We can do this because energies are: **[SCALARS | VECTORS]**

$\sum U_G =$ _____ *(depends on # of masses)*

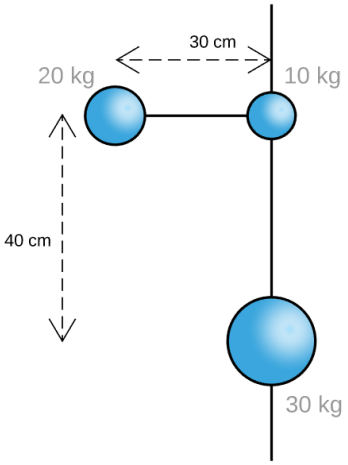


EXAMPLE: Calculate the total gravitational potential energy in the equilateral triangle system of masses below.

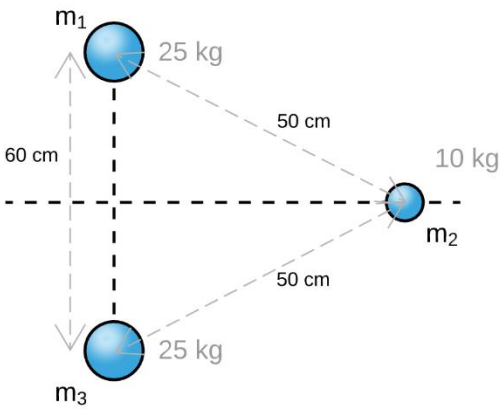


GRAVITATIONAL CONSTANTS
$G = 6.67\times10^{-11}\ \frac{m^3}{kg\cdot s^2}$

PRACTICE: What is the total gravitational potential energy of this system of masses?



EXAMPLE: a) What is the gravitational potential energy of the system? b) The two 25-kg masses are fixed and cannot move. If the 10-kg mass is released from rest, what will be its speed when it is directly between the two 25-kg masses?



EQUATIONS	CONSTANTS
$F_G = \frac{Gm_1m_2}{r^2}$ $\quad r = R + h$	$G = 6.67\times10^{-11}\ \frac{m^3}{kg\cdot s^2}$
$U_G = -\frac{GMm}{r}$ $K_i + U_i + W_{NC} = K_f + U_f$	