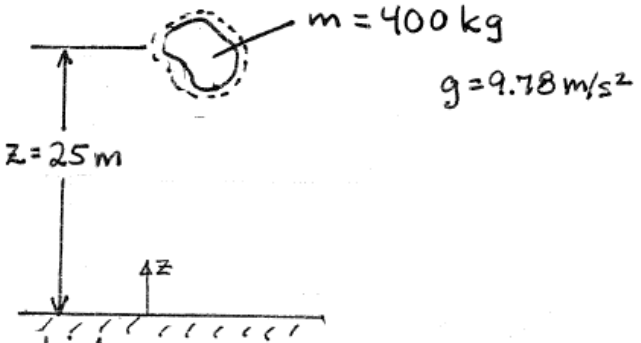
PROBLEM 2.2

KNOWN: An object of known mass is located at a specified elevation relative to the surface of the earth.

FIND: Determine gravitational potential energy of the object.

ENGR. MODEL: (1) The object is a closed system. (2) The acceleration of gravity is constant.




ANALYSIS: The gravitational potential energy is

$$PE = mgz$$

$$= (400\,kg)\left(9.78\,\frac{m}{s^2}\right)(25\,m)\left|\frac{1\,N}{kg\,m/s^2}\right|\left|\frac{1\,kN}{1000\,N}\right|\left|\frac{1\,kJ}{1\,kN\cdot m}\right|$$

$$= 97.8\,kJ \longleftarrow PE$$