Answer on Question #47677 – Physics - Mechanics | Kinematics | Dynamics

A 500 g stone is thrown up with a velocity of 15 m/s.
find P.E at maximum height
find K.E when it hits the grond

Solution:
$m = 0.5 \text{ kg} - \text{mass of the stone;}$
$v_1 = 15\dfrac{m}{s} - \text{initial velocity of the stone;}$
Initial velocity of the stone is equal to the final velocity of the stone because of the
law of conservation of energy (the total energy of an isolated system cannot change)

$$W_1 = W_2$$
$$KE_1 + PE_1 = KE_2 + PE_2$$
$$KE_1 + 0 = KE_2 + 0$$
$$KE_2 = KE_1 = \frac{mv_1^2}{2} = \frac{0.5 \text{ kg} \cdot \left(15\frac{m}{s}\right)^2}{2} = 56.2 \text{ J}$$

law of conservation of energy for initial state and state 3 (at the maximum height,
$v_3 = 0$)

$$W_1 = W_3$$
$$KE_1 + PE_1 = KE_2 + PE_2$$
$$KE_1 + 0 = 0 + PE_2$$
$$PE_2 = KE_1 = \frac{0.5 \text{ kg} \cdot \left(15\frac{m}{s}\right)^2}{2} = 56.2 \text{ J}$$

Answer: P.E at maximum height: 56.2 J
K.E when it hits the grond: 56.2 J