A 36-kg girl is bouncing on a trampoline. During a certain interval after leaving the surface of the trampoline, her kinetic energy decreases to 230 J from 460 J. How high does she rise during this interval? Neglect air resistance.

Solution.

$$m = 36kg, E_{k1} = 460J, E_{k2} = 230J, g = 9.8\frac{m}{s^2};$$

$$h - ?$$

The potential energy of the girl is equal to difference of her kinetic energy taken with a "minus", because it decreases:

$$U = -(E_{k2} - E_{k1}).$$

The potential energy is:

$$U = mgh.$$

$$mgh = -(E_{k2} - E_{k1});$$

$$mgh = E_{k1} - E_{k2}.$$

The high which the girl rise during this interval is:

$$h = \frac{E_{k1} - E_{k2}}{mg}.$$

$$h = \frac{460J - 230J}{36kg \cdot 9.8\frac{m}{s^2}} = 0.65m.$$

Answer: The high which the girl rises during this interval is $h = 0.65m$.