Answer on Question 38449 - Physics - Other

A cheerleader lifts his 40.4 kg partner straight up off the ground a distance of 0.727 m before releasing her. The acceleration of gravity is 9.8 m/s2. If he does this 14 times, how much work has he done

The work the cheerleader performs is that of increasing the potential energy of the partner.

Within the gravitational field of the Earth, this energy can be expressed as

$W = mgh$, where g is the acceleration of gravity, m is the partner's mass, and h is considered to be the displacement of the partner's center of mass.

Finally, if this is performed N times, the resulting work is going to be

$A = NW = Nmgh$

Using the numerical values, we substitute

$A = 14 \times (40.4kg) \times (9.8\frac{m}{s^2}) \times (0.727m) \approx 4030J.$

Answer: about 4030 joules.