## Answer on Question #40968, Physics, Mechanics

A 95-kilogram student climbs 4.0 meters up a rope in 3.0 seconds. What is the power output of the student?

(a) $1.3 \cdot 10^2$ W

(b) $1.2 \cdot 10^3$ W

(c) $3.8 \cdot 10^2$ W

(d) $3.7 \cdot 10^3$ W

(e) n.o.t.a.

**Solution:**

Given:

$m = 95\ kg,$

$h = 4.0\ m,$

$t = 3.0\ s,$

$P = ?$

Power is the rate at which work is done. It is the work/time ratio. Mathematically, it is computed using the following equation.

$$Power = \frac{Work}{time}$$

In our case work is increasing the potential energy of body

$$W = mgh$$

Thus,

$$P = \frac{mgh}{t} = \frac{95 \cdot 9.81 \cdot 4}{3} = 1242.6 = 1.2 \cdot 10^3 \text{ Watts}$$

**Answer.** (b) $1.2 \cdot 10^3$ W.