Answer on Question #49141 – Physics – Other

1. A runner is on the outside of a circular track of radius 21 m. If the runner travels with an average speed of 5.0 m/s, how long will it take her to run 4 laps?

$r = 21 m$ $v = 5 \frac{m}{s}$ $N = 4$ $t - ?$	*Solution.* The time which is spent for running a lap with a constant speed is $t_0 = \frac{l}{v}$, where $l = 2\pi r$ is the circle length. So, a sportsman can run N laps spending time $t = N t_0$, $\boxed{t = \frac{2\pi N r}{v}}$.

Let check the dimension: $[t] = \frac{m}{m/s} = s$.

Let evaluate the quantity: $t = \frac{2 \cdot 3.14 \cdot 4 \cdot 21}{5} = 105.5(s)$.

Answer: 105.5 s.