

task_bln2sqhr55mlxrj3_with_calculation

Student Group

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Exercise E9 Conversion: Vacuum Cleaner

Your $18\text{~}\{\text{V}\}$ vacuum cleaner is equipped with a $4.0\text{~}\{\text{Ah}\}$ battery, it runs $15\text{~}\{\text{min}\}$.

How much electrical power is consumed by the motor during this time on average?

Solution: $288\text{~}\{\text{W}\}$

$$\begin{aligned} W &= 18\text{~}\{\text{V}\} \cdot 4.0\text{~}\{\text{Ah}\} = 72\text{~}\{\text{Wh}\} \\ t &= 15\text{~}\{\text{min}\} = 0.25\text{~}\{\text{h}\} \\ P &= \frac{W}{t} = \frac{72\text{~}\{\text{Wh}\}}{0.25\text{~}\{\text{h}\}} = 288\text{~}\{\text{W}\} \end{aligned}$$

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