

Assessment #2: PHYS 320

1) OMG! We left ALL the digital scales on last Friday... they were on until Monday morning when Kevin came in. We need to pay for this wasted energy! I looked them up, they have a maximum power consumption of 3W each. We have 8 tables.

- What is the total energy that was wasted by our collective negligence?
- How much money did this mistake cost Cal Poly?

$$a) \quad P = \frac{\Delta E}{\Delta t} \quad \Delta E = P \Delta t$$

$$\Delta E = (3W)(8) \overset{\text{8 scales}}{\downarrow} 3 \text{ days} \cdot \frac{24 \text{ hr}}{\cancel{\text{d}}} \cdot \frac{3600 \text{ s}}{\cancel{\text{hr}}}$$

we want answer in kWhr, so keep time in hr

$$= 24W \cdot 72 \text{ hr} \approx$$

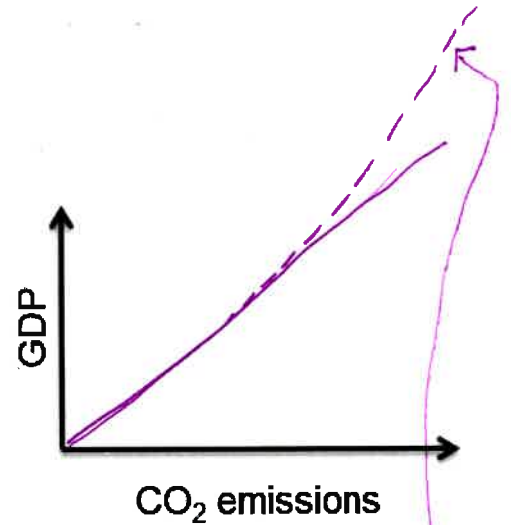
$$\approx 24W \cdot \left(\frac{3}{4}\right) 100 \text{ hr} \approx 1.8 \text{ kWhr}$$

$$b) \quad \frac{\sim 15 \text{¢}}{\text{kWhr}} \cdot 1.8 \text{ kWhr} \approx 30 \text{¢} \text{ or a little less}$$

2) If pink insulation is 99% empty space, how is it that is able to greatly reduce the rate of flow of thermal energy?

insulation disrupts bulk flow of fluid or gas, preventing convection, reducing heat flow to conduction + radiation, which is much weaker than convection.

3) Please make a graph of the amount of CO₂ emitted by a country and the GDP (financial income) of that country. Then please explain why the graph should look this way.



We generate wealth (GDP) through conversion of fossil fuels to CO₂ AND we use this wealth to burn fossil fuels for our amusement.

It is possible that it curves upward because when we get rich, we buy renewable energy and increased efficiency, allowing us to generate more wealth with less CO₂ emissions, hence the dotted line.

What's your name?

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