8. (10 points) A reversible heat engine rejects heat into a nearby lake at 25 ºC. If the efficiency $\text{is} = 79 \cdot \%$, the temperature of the heat source must be closest to:

$$\text{Choices} = \begin{pmatrix} \text{"A"} & 1111 \\ \text{"B"} & 1147 \\ \text{"C"} & 1182 \\ \text{"D"} & 1217 \\ \text{"E"} & 1253 \\ \text{"F"} & 1288 \\ \text{"G"} & 1324 \\ \text{"H"} & 1358 \end{pmatrix} \cdot °\text{C}$$

9. (10 points) A freezer unit is used to keep a refigerated space cold $\text{at} = -4 \cdot °\text{C}$. It rejects 850 W of heat into the nearby surroundings that have a constant temperature $\text{of} = 28 \cdot °\text{C}$. The minimum work that must be supplied to the compressor is closest to:

$$\text{Choices} = \begin{pmatrix} \text{"A"} & 68.4 \\ \text{"B"} & 73.9 \\ \text{"C"} & 79.4 \\ \text{"D"} & 84.8 \\ \text{"E"} & 90.3 \\ \text{"F"} & 95.8 \\ \text{"G"} & 101.3 \\ \text{"H"} & 106.8 \end{pmatrix} \cdot \text{W}$$

10. (8 points) An inventor claims to have made a new kind of heat engine that $\text{absorbs} = 810 \cdot \frac{\text{Btu}}{\text{hr}}$ of geothermal heat at an average temperature $\text{of} = 120 \cdot °\text{F}$ and rejects heat into the atmosphere at 65 ºF. If the engine $\text{produces} = 160 \cdot \frac{\text{Btu}}{\text{hr}}$ of work, then the efficiency of the "proposed" engine is closest to:

$$\text{Choices} = \begin{pmatrix} \text{"A"} & 13.7 \\ \text{"B"} & 14.8 \\ \text{"C"} & 15.7 \\ \text{"D"} & 16.8 \\ \text{"E"} & 17.8 \\ \text{"F"} & 18.8 \\ \text{"G"} & 19.8 \\ \text{"H"} & 20.8 \end{pmatrix} \cdot \%$$

11. (2 point) Which description is correct for this heat engine?

$$\text{Choices} = \begin{pmatrix} \text{"A"} & \text{"reversible; ideal"} \\ \text{"B"} & \text{"impossible; unreal"} \\ \text{"C"} & \text{"possible; real"} \end{pmatrix}$$

ExamForm = 55

Key =

	1
1	"A"
2	
3	
4	
5	
6	
7	
8	"B"
9	"E"
10	"G"
11	"B"
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