The basis for calculating heats of reaction is known by the following formula:

$$
\Delta \mathrm{H}_{\mathrm{rxn}}=\mathrm{H}_{\text {products }}-\mathrm{H}_{\text {reactants }}
$$

For the following balanced equations, find the $\Delta \mathrm{H}_{\mathrm{rxn}}$. Use the values of $\Delta \mathrm{H}_{\mathrm{f}}$ from the table given in class.

1) $2 \mathrm{Fe}(\mathrm{s})+3 \mathrm{CO}_{2}(\mathrm{~g}) \rightarrow \mathrm{Fe}_{2} \mathrm{O}_{3}(\mathrm{~s})+3 \mathrm{CO}(\mathrm{g})$
2) $4 \mathrm{NH}_{3}(\mathrm{~g})+7 \mathrm{O}_{2}(\mathrm{~g}) \rightarrow 4 \mathrm{NO}_{2}(\mathrm{~g})+6 \mathrm{H}_{2} \mathrm{O}(\mathrm{g})$
3) $3 \mathrm{NO}_{2}(\mathrm{~g})+\mathrm{H}_{2} \mathrm{O}(\mathrm{l}) \rightarrow 2 \mathrm{HNO}_{3}(\mathrm{l})+\mathrm{NO}(\mathrm{g})$
