Consider the following reaction:

\[ \text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{g}) \]

If you do some experiments and find that methane is used up at a rate of \(-3.67 \times 10^{-5}\) atm/s...

1. (3 pts) At what rate is \(\text{CO}_2\) formed?
   \[ 3.67 \times 10^{-5} \text{ atm/s} \]

2. (3 pts) At what rate is \(\text{H}_2\text{O}\) formed?
   \[ 2 \times 3.67 \times 10^{-5} \text{ atm/s} = 7.34 \times 10^{-5} \text{ atm/s} \]

3. (4 pts) Let's pretend that the equation given above represents an elementary reaction. Write the rate law you would expect for this elementary reaction.
   \[ \text{RATE} = k \left[ \text{CH}_4 \right] \left[ \text{O}_2 \right]^2 \]

Extra Credit (1 pt) On Friday I mentioned that you should celebrate the birthdays of Kreisler and Heifetz AND I mentioned that if you didn't know who these guys were you should look them up. So, why are these two guys famous?

They are, arguably, the 2 greatest violinists of the 20th century.