EXTRA PRACTICE OF ORDER and RATE CONSTANT FROM INITIAL RATE

1. If we have the following experimental initial rate data for the reaction,

\[
A + B \rightarrow 2C
\]

<table>
<thead>
<tr>
<th>experiment</th>
<th>[A], M</th>
<th>[B], M</th>
<th>rate = -d[A]/dt, M h(^{-1})</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.50</td>
<td>0.50</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>1.0</td>
<td>0.50</td>
<td>4.8</td>
</tr>
<tr>
<td>3</td>
<td>2.0</td>
<td>1.0</td>
<td>38.4</td>
</tr>
</tbody>
</table>

a) Order in A = ______ ; order in B = _________

Show work below:

b) Write the rate law using the above information:

c) Value of rate constant with unit: __________ (use expt. 1 for this calculation)

d) What will be the rate of appearance of C if 1.0 M of each A and B are used in the above reaction?

2. Use the following data for the reaction \( A + 3B \rightarrow 5C \)

<table>
<thead>
<tr>
<th>Exp.#</th>
<th>[A]</th>
<th>[B]</th>
<th>rate of disappearance of A (M/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.10</td>
<td>0.10</td>
<td>(5 \times 10^{-5})</td>
</tr>
<tr>
<td>2</td>
<td>0.20</td>
<td>0.10</td>
<td>(5 \times 10^{-5})</td>
</tr>
<tr>
<td>3</td>
<td>1.84</td>
<td>0.20</td>
<td>(2.5 \times 10^{-5})</td>
</tr>
</tbody>
</table>

a) Determine the rate law:

b) Calculate the value of and unit of rate constant

c) What will be the rate of appearance of C if 1.0 M of each A and B are used in the above reaction?

Show work for question 2 on next page.