#1: Please fill in the missing numbers!

![Diagram of Body Water Compartments]

### Total Body Water
- Extracellular Fluid
- Intracellular Fluid
- Plasma Water
- Interstitial Fluid

#2: The volume of distribution \( V_d \) of a lipophilic drug A is 800L. Answer the following questions with true or false!

a) Drug A is able to cross membranes
b) Drug A does not show any tissue protein binding
c) Plasma protein binding is more pronounced than tissue binding
d) \( V_d \) indicates that this drug is highly metabolized in the tissue
e) Drug A does not leave the plasma
f) \( V_d \) does reflect a real volume

#3: Basics and Background of \( V_d \)

a) Give a definition of the Volume of distribution in your own words and give additionally the formula used for calculations.

b) Patient H. was given 100mg of drug M intravenously. His plasma levels are listed below. Please calculate \( V_d \! \)

<table>
<thead>
<tr>
<th>Time (h)</th>
<th>Cp (μg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>171</td>
</tr>
<tr>
<td>4</td>
<td>119</td>
</tr>
<tr>
<td>6</td>
<td>79.5</td>
</tr>
<tr>
<td>7.5</td>
<td>51</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>
#4: Quinidine has a plasma protein binding, ranging from 70-90%. In patients with chronic liver disease plasma protein binding is decreased by 20%. How will the volume of distribution change? Use a plasma volume of 3 L and the fraction bound in plasma 85% (for normal patients), a tissue volume of 38 L and the fraction unbound in tissue 30% to calculate the volume of distribution in patients with liver disease.