1. How many protons and electrons in each of the following?

a) \( \text{Pt} \)  78 protons, 78 electrons

b) \( \text{P}^{-3} \)  15 protons, 18 electrons

c) \( \text{Ge}^{+2} \)  32 protons, 30 electrons

2. How many protons, neutrons and electrons in each of the following?

a) \( ^{19}_{9} \text{F} \)  9 protons, 9 electrons, 10 neutrons

b) \( ^{32}_{16} \text{S}^{2-} \)  16 protons, 18 electrons, 16 neutrons

3. Complete the following table.

<table>
<thead>
<tr>
<th>Symbol</th>
<th># protons</th>
<th># neutrons</th>
<th># electrons</th>
<th>charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>( ^{96}_{42} \text{Mo} )</td>
<td>42</td>
<td>54</td>
<td>42</td>
<td>0</td>
</tr>
<tr>
<td>( ^{119}_{50} \text{Sn}^{2+} )</td>
<td>50</td>
<td>69</td>
<td>48</td>
<td>+2</td>
</tr>
<tr>
<td>( ^{83}_{36} \text{Kr} )</td>
<td>36</td>
<td>47</td>
<td>36</td>
<td>0</td>
</tr>
<tr>
<td>( ^{89}_{34} \text{Se}^{2-} )</td>
<td>34</td>
<td>45</td>
<td>36</td>
<td>2-</td>
</tr>
</tbody>
</table>

4. Express each of the following as either a decimal number or in standard scientific notation.

a) 2,200,000  
   \( 2.2 \times 10^6 \)

b) 8.900 x 10^{-6}  
   \( 0.000008900 \)

c) 4.2389 x 10^6  
   \( 4,238,900 \)

d) 602,300,000,000,000,000,000,000  
   \( 6.023 \times 10^{23} \)

e) 0.00005670  
   \( 5.670 \times 10^{-5} \)

f) 3.56  
   \( 3.56 \times 10^0 \)
5. Perform the following operations and report your answer in exponential notation.

a) \((3.2 \times 10^4)(2.8 \times 10^3) = 8.96 \times 10^7\)

b) \((4.67 \times 10^{-5})(1.04 \times 10^{-8}) = 4.86 \times 10^{-13}\)

c) \(\frac{1.04 \times 10^8}{6.81 \times 10^{-3}} = 1.53 \times 10^{10}\)

d) \(\frac{3.42}{8.45 \times 10^{-2}} = 4.05 \times 10^1\)

e) \((1.31 \times 10^5) + (1.04 \times 10^4) = 1.41 \times 10^5\)

f) \((3.86 \times 10^{-3}) + (4.29 \times 10^{-2}) = 4.68 \times 10^{-2}\)

g) \((4.25 \times 10^{-11}) - (2.56 \times 10^{-7}) = -2.56 \times 10^{-7}\)

h) \((7.33 \times 10^5) - (5.18 \times 10^4) = 6.81 \times 10^5\)