#1. Show the representation of \(-345_{10}\) in the following representation schemes (assume 16-bit words):

a) sign magnitude

b) one’s-complement

c) two’s complement

#2. Convert \(474_{10}\) into (assume 16-bit words):

a) binary

b) octal

c) hexadecimal

#3. Fill in the CCR bits for the following addition instructions (8-bit two’s-complement numbers):

\[
\begin{array}{c}
11110110 \\
+ 10001010 \\
\hline
\end{array} \quad \begin{array}{c}
01101010 \\
+ 01011001 \\
\hline
\end{array}
\]

\[
\begin{array}{cccccc}
N & Z & V & C \\
\hline
| & | & | & | \\
\hline
\end{array} \quad \begin{array}{cccccc}
N & Z & V & C \\
\hline
| & | & | & | \\
\hline
\end{array}
\]

(over)
#4. Powers of 2

\[ 32K = 2^{15} \]

\[ 2^{28} = \text{______} \quad \text{(in terms of K, M, G, etc.)} \]

#5. In a Big-Endian architecture, show how the bytes are laid out in memory for the following statement (write the hexadecimal values of the bytes in the appropriate memory locations):

\[
\text{long john} = 0x86753091;
\]

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>

What is the hex value of the least significant byte?  _______