1. What is Cygwin? Write at least two complete sentences.

2. Convert the decimal number 281 in hexadecimal notation. Execute the algorithm by hand and show all steps.
3. Consider the circuit drawn below:

(a) For the circuit on the left, and $x = 0$, $y = 1$ and $z = 1$, what is the output? Mark the results on the circuit drawing above.

(b) What are the logical expressions that represent both circuits?

(c) Use truth tables to show that both circuits are equivalent.

4. Given in a string $s$ is a phone number in the format xxx xxx xxxx.
   Give the Python commands to make a new string $t$ to put the phone number in the format (xxx)xxxxxxx.
   For example: if $s = "312 996 4609"$, then the new string $t = "(312)9964609"$. 
5. Consider the flowchart:

(a) What does the algorithm print? Complete the table below:

<table>
<thead>
<tr>
<th>n</th>
<th>d</th>
<th>q</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Write Python code for the algorithm.
6. The built-in function \( \log() \) of the \texttt{math} module has as default base \( e \) and returns by default the natural logarithm. Write a function \( \texttt{logarithm}() \) that has 10 as default base, using the formula \( \texttt{logarithm}(x,b) = \log(x)/\log(b) \). If 0 is given as base, then \( \log(x) \) must be returned.

7. Give all Python commands for the following tasks. Generate a list of 100 random integer numbers, distributed uniformly in the interval \([0,20]\). Select from this list all numbers divisible by 4. Subtract one from all elements in the selected list.