1. (6 points) The designers of a new handheld game system are still trying to decide on a processor for their system. They scrapped the previous ideas and there are three new processors to consider, described in Table 1.

<table>
<thead>
<tr>
<th>Desired Clock Rate (MHz)</th>
<th>Power/Speed (mW/MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor A</td>
<td>40</td>
</tr>
<tr>
<td>Processor B</td>
<td>30</td>
</tr>
<tr>
<td>Processor C</td>
<td>12</td>
</tr>
</tbody>
</table>

Assuming that the other parts of the system are identical, which processor would provide the longest battery life (draw the least power)?

A: 40·5 = 200mW  
B: 30·6 = 180mW  
C: 12·20 = 240mW  
**Processor B**

2. (6 points) Connect the chip names to their functions in the Atari 2600:  
   (note: the order of items in the left column varied between the quizzes)

6532  →  CPU  
6507 (6502)  →  Video, Sound, Collision, Paddle inputs  
TIA  →  Memory, Timers, I/O

3. (8 points) On the back of this sheet, write pseudo-assembly code to evaluate the following expression in a **register-register architecture**. Use instruction mnemonics of the forms `ADD/MUL/DIV dst srcA srcB` and `LOAD/STORE addr reg`. Use registers `r0 through r15`. If you need to use temporary memory locations, name them `temp1, temp2, etc.`

\[ X = (A \times B \times C) / (M + (A \times C)) \]
load A r1
load B r2
load C r3
load M r4
mul r5, r1, r3  #A * C
mul r6, r5, r2 # A * C * B (= A * B * C)
add r7, r5, r4 # M+ (A * C)
div r8, r6, r7 # (A * C * B) / (M + (A * C))
store X r8