Operating Systems - Week 9 - Memory Management Revision

Please complete previous weeks examples.
Also - some of you found paging and segmentation difficult - here are some revision examples.

Q1. Consider the following page reference string.
1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6
How many page faults would occur for the following replacement algorithms, assuming one, two, three, four, five, six or seven frames? Remember that all the frames are initially empty so your first unique pages will all cost one fault each.

- LRU replacement
- FIFO replacement

Q2. Consider a logical-address space of eight pages of 1,024 words each. mapped onto physical memory of 32 frames.
(a) How many bits are in the logical address?
(b) How many bits are in the physical address?

Q3. The following figure (Figure 1 p2) illustrates segmentation with a main program using a subroutine and requiring the calculation of a square root.
(a) What location in main memory will a reference to byte 53 of the main program map to?
(b) What location in main memory will a reference to byte 852 of the stack map to?
(c) What location in main memory will a reference to byte 1222 of the subroutine map to?

Q4. Consider the following segment table

<table>
<thead>
<tr>
<th>Segment Base Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>0       219  600</td>
</tr>
<tr>
<td>1       2300 14</td>
</tr>
<tr>
<td>2       90    100</td>
</tr>
<tr>
<td>3       1327  580</td>
</tr>
<tr>
<td>4       1952  96</td>
</tr>
</tbody>
</table>

What are the physical addresses for the following logical addresses?
(a) 0430
(b) 110
(c) 2500
(d) 3400
(e) 4112
Q5 Compare paging and segmentation, listing their advantages and disadvantages.