1. Complete the table (Table 1) below
2. Use Excel to draw the total product (TP) curve.

3)  Use Excel to draw the average product (AP) and marginal product (MP) curves in the same space

     Table showing the Average and Marginal product of labor for a hypothetical firm

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Amount of labour( units) | Amount of capital(No. of machines) | Output of parts(Q, hundreds of parts) | Average product (Q/L) | Marginal product(∆Q/∆L) |
|   0 | 5 |     0 | - | - |
|   1 | 5 |   49 | 49 | 49 |
|   2 | 5 | 132 | 66 | 83 |
|   3 | 5 | 243 | 81 | **\*\*** |
|   4 | 5 | 376 | 94 | 133 |
|   5 | 5 | 525 | **\*\*** | 149 |
|   6 | 5 | 684 | 114 | 159 |
|   6.666 | 5 | 792.59 | 120.09 | **\*\*\*** |
|   7 | 5 | 847 | **\*\*\*\*** | 163 |
|   8 | 5 | 1008 | 126 | 161 |
| 9 | 5 | 1161 | **\*\*\*\*** | **\*\*\*** |
| 10 | 5 | 1300 | 130 | 139 |
| 11 | 5 | 1419 | **\*\*\*** | 119 |
| 12 | 5 | 1512 | 126 | 93 |
| 13 | 5 | 1573 | 121 | **\*\*\*\*** |
| 14 | 5 | 1596 | **\*\*\*\*** | 23 |
| 15 | 5 | 1575 | 105 | **\*\*\*\*\*\*** |

4) Use the information from the completed table and the graphs to identify the **three** stages of production

5)  Explain why the firm’s short run production has only one ‘rational’ stage of production