1. A) Taxable Income = $55,000 - $7,000 = $48,000

   Income Tax Paid:
   - On 1st $25,750 = $3,862.50 @ 15%
   - On next $22,250 = $6,230.00 @ 28%
   Total = $10,092.50

   Marginal Tax Rate = 28%
   Average Tax Rate = 18.4% = \( \frac{10,092.50}{55,000} \times 100 \)

B) Taxable Income = $39,000 - $7,000 = $32,000

   Income Tax Paid = $3,450 @ 15%

   Marginal Tax Rate = 15%
   Average Tax Rate = 11.5% = \( \frac{3,450}{32,000} \times 100 \)

C) Taxable Income = $85,000 - $14,000 = $71,000

   Income Tax Paid:
   - On 1st $25,750 = $3,862.50 @ 15%
   - On next $36,700 = $10,270 @ 28%
   - On last $8,550 = $2,650.50 @ 31%
   Total = $16,789

   Marginal Tax Rate = 31%
   Average Tax Rate = 19.8% = \( \frac{16,789}{85,000} \times 100 \)

D) Maximum Tax Penalty = $16,789 - (10,092.50 + 3,450)
   = $16,789 - $13,542.50
   = $3,246.50
2. | Workers | Output | MP   | TC   | ATC  | MC   |
<table>
<thead>
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<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>20</td>
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<tr>
<td>1</td>
<td>20</td>
<td>30</td>
<td>300</td>
<td>8.00</td>
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<td>5.33</td>
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<tr>
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<td>150</td>
<td>5</td>
<td>900</td>
<td>5.81</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Patterns:
(a) MP ↑ at first but then ↓ due to diminishing MP
(b) ATC ↓ but ↑ after Q=190 (ATC is U-shaped)
(c) MC is also U-shaped
(d) They move in opposite directions
(e) When MP ↑ MC ↓ and vice-versa
(f) When MC < ATC, ATC is ↓
(g) When MC > ATC, ATC is ↑

\[ \text{(and so on)} \]