1. Phillips Curve

a) In this problem, $(\mu + z) = .18$, and $\alpha = 3$.

\[ u_n = (\mu + z) / \alpha = .18 / 3 = .06, \text{ or } 6\%. \]

Use the equation $\pi_i = \pi_i^* + (\mu + z) - \alpha u_t$, where $\pi_i^* = \theta \pi_{i-1}$.

When $\theta = 0$, we have $\pi_i^* = 0$, so $\pi_i = (\mu + z) - \alpha u_t = .18 - 3(.05) = .03$, or 3%.

When $\theta = 0$, we have $\pi_i^* = \pi_{i-1}$, so $\pi_i = \pi_{i-1} + (\mu + z) - \alpha u_t = \pi_{i-1} + .18 - 3(.05) = \pi_{i-1} + .03$.

b) 

<table>
<thead>
<tr>
<th>Period</th>
<th>Inflation rate $(\theta=0)$</th>
<th>Inflation rate $(\theta=1)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>t+1</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>t+2</td>
<td>3%</td>
<td>9%</td>
</tr>
<tr>
<td>t+3</td>
<td>3%</td>
<td>12%</td>
</tr>
</tbody>
</table>

c) When $\theta = 1$, keeping the unemployment rate below the natural rate causes a continually increasing rate of inflation, and, therefore, an acceleration of the price level. When $\theta = 0$, by contrast $u_t < u_n$ implies a greater inflation rate than otherwise, but not an increasing one.

d) When $\theta = 1$, whenever $u_t < u_n$, the inflation rate will continually increase; when $u_t > u_n$, the inflation rate will continually decrease. The authorities cannot observe $u_n$, but they can observe what happens to the inflation rate at different values of $u_t$. By trial and error, they could (in theory) find the $u_t$ where the inflation rate remains stable. This should be the natural rate of unemployment.

2. Open Economy

a) In the short run, the revaluation causes a real appreciation of the domestic currency, increasing the relative price of domestic goods compared to foreign goods and decreasing net exports. This will cause the AD curve to shift leftward along an unchanged AS curve.

b) In the short run, the real exchange rate falls (a real appreciation); net exports and output decrease.

c) The new long-run equilibrium lies along the new AD curve, at the initial level of output $Y_n$. (That is, the AS curve shifts downward along the new AD curve.)

d) In the long run, the real exchange rate, net exports, and output will all have returned to their initial values.

3. Growth

The production function: $Y = \sqrt{K} \sqrt{N}$

The saving rate ($s$) = .10

The depreciation rate ($\delta$) = .10
a) With this production function, steady-state capital per worker is given by text equation (23.8):
\[ K / N = (s / \delta)^2 = (.10 / .10)^2 = 1.0. \]

b) With this production function, steady-state output per worker is given by text equation (23.9):
\[ Y / N = s / \delta = .10 / .10 = 1.0. \]

c) If \( \delta = .20 \), the new steady-state capital per worker will be \( K / N = (s / \delta)^2 = (.10 / .20)^2 = .25. \)
The new steady-state output per worker will be \( Y / N = s / \delta = .10 / .20 = .5. \)