(2) a) $x^{(i)} = (0,5; 0,5; 0,5)$
$w^{(i)} = (0,5; 0,5; 0,5)$

$x_k^{(1)'} = x_k^{(1)} - \alpha \sum_{n(i,j)=1} (w^{(j)} \cdot x^{(i)} - y^{(i,j)}) w_k^{(i)} = 0,5 - 0,2 (0,75-5+0,75-5+0,75+0,75) \cdot 0,5 =$

$= 0,5 - \frac{2}{10} \cdot \frac{35}{10} = -0,2$. ~~Some for $x_k^{(2)}$ and $x_k^{(3)}$, as all features are the same~~

$w_k^{(1)'} = w_k^{(1)} - \alpha \sum_{n(i,j)=1} (w^{(j)} \cdot x^{(i)} - y^{(i,j)}) x_k^{(1)} = 0,5 - 0,2 (\dots) \cdot 0,5 = -0,2$

$x_k^{(2)} = x_k^{(2)} - \alpha \sum_{(i,j)=1} (w^{(j)} \cdot x^{(i)} - y^{(i,j)}) \cdot w_k^{(i)} = 0,5 - 0,2 (0,75-5+0,75-4+0,75+0,75) \cdot 0,5 =$

$= 0,5 + \frac{2}{10} \cdot 6 \cdot \frac{5}{10} = 1,1$

Since initial configurations are the same $\Rightarrow$ $x^{(1)} = (-0,2; -0,2; -0;2)$

$x^{(2)} = (1,1; 1,1; 1,1)$

$w^{(1)} = (-0,2; -0,2; -0,2)$

$w^{(2)} = (1,1; 1,1; 1,1)$

Pred for user 1 and movie 1: $x^{(1)} w^{(1)} = (-0,2; -0,2; -0,2)(-0,2; -0,2; -0,2) = 3 \cdot 0,04 = 0,12$

Pred. for user 2 and movie 2: $x^{(2)} \cdot w^{(2)} = (1,1; 1,1; 1,1)(1,1; 1,1; 1,1) = 3 \cdot 1,1 = 3,3$