3.5

1. $p(4) = 946$

4. $b_1 = 41$, $b_0 = 140$, $c_1 = 146$, $c_0 = 519$, $J = -556$. Hence $\delta u = -0.694$, and $\delta V = 1.509$.

10. $p(6) = 10181$, $p'(6) = 7030$. Hence $z_1 = z_0 - \dfrac{p(z_0)}{p'(z_0)} = 6 - \dfrac{10181}{7030} = 4.552$

16. Just follow the proof of Theorem 5.

3.6

1. Let $f_1(x, y) = \begin{bmatrix} x - 2y + y^2 + y^3 - 4 \\ -x - y + 2y^2 - 1 \end{bmatrix}$.

$h(t, x, y) = f(x, y) + (1 - t)(f(x, y) - f(x_0, y_0)) = f(x, y) + (t - 1)f(x_0, y_0) = \begin{bmatrix} x - 2y + y^2 + y^3 - 4t \\ -x - y + 2y^2 - t \end{bmatrix}$.

Hence the equation (9) in page 133 is given by

$$\begin{bmatrix} -4 & 1 & -2 + 2y + 3y^2 \\ -1 & -1 & -1 + 4y \end{bmatrix} \begin{bmatrix} t' \\ x' \\ y' \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

Then by the equation (10) in page 133, we have

$$\begin{cases} t' = \det \begin{bmatrix} 1 & -2 + 2y + 3y^2 \\ -1 & -1 + 4y \end{bmatrix} = 3y^2 + 6y - 3, \quad t(0) = 0 \\ x' = -\det \begin{bmatrix} -4 & -2 + 2y + 3y^2 \\ -1 & -1 + 4y \end{bmatrix} = -3y^2 + 14y - 2, \quad x(0) = 0 \\ y' = \det \begin{bmatrix} -4 & 1 \\ -1 & -1 \end{bmatrix} = 5, \quad y(0) = 0 \end{cases}$$