3. $P_1(100,100)$ $P_2(200,100)$ $P_3(300,0)$

① $$P_x(t) = (t^2\ t\ 1)\begin{pmatrix} 2 & -4 & 2 \\ -3 & 4 & -1 \\ 1 & 0 & 0 \end{pmatrix}\begin{pmatrix} 100 \\ 200 \\ 300 \end{pmatrix}$$

$$= (t^2\ t\ 1)\begin{pmatrix} 0 \\ 200 \\ 100 \end{pmatrix} = 200t + 100$$

② $$P_y(t) = (t^2\ t\ 1)\begin{pmatrix} 2 & -4 & 2 \\ -3 & 4 & -1 \\ 1 & 0 & 0 \end{pmatrix}\begin{pmatrix} 100 \\ 100 \\ 0 \end{pmatrix}$$

$$= (t^2\ t\ 1)\begin{pmatrix} -200 \\ 100 \\ 100 \end{pmatrix} = -200t^2 + 100t + 100$$

4. $P_1(100,100)$, $P_2(200,100)$, $P_3(300,0)$

$$P_x(t) = (t^2\ t\ 1)\begin{pmatrix} 1 & -2 & 1 \\ -2 & 2 & 0 \\ 1 & 0 & 0 \end{pmatrix}\begin{pmatrix} 100 \\ 200 \\ 300 \end{pmatrix}$$

$$= (t^2\ t\ 1)\begin{pmatrix} 0 \\ 200 \\ 100 \end{pmatrix} = 200t + 100$$

$$P_y(t) = (t^2\ t\ 1)\begin{pmatrix} 1 & -2 & 1 \\ -2 & 2 & 0 \\ 1 & 0 & 0 \end{pmatrix}\begin{pmatrix} 100 \\ 100 \\ 0 \end{pmatrix}$$

$$= (t^2\ t\ 1)\begin{pmatrix} -100 \\ 0 \\ 100 \end{pmatrix} = -100t^2 + 100$$

5.