zad3. DE CASTEYAU METODA

$u \in [0,1]$ $\quad r_i = (1-u)p_i + u p_{i+1} \quad i=0,1,2$

$s_i = (1-u)r_i + u r_{i+1} \quad i=0,1$

$t_0 = (1-u)s_0 + u s_1$

$f(u) = t_0$

$$f(u) = B_0(u)p_0 + B_1(u)p_1 + B_2(u)p_2 + B_3(u)p_3$$

$B_0 = (1-u)^3$

$B_1 = 3u(1-u)^2$

$B_2 = 3u^2(1-u)$

$B_3 = u^3$

$$f(u) = (1-u)^3 p_0 + 3u(1-u)^2 p_1 + 3u^2(1-u)p_2 + u^3 p_3$$

$$t_0 = (1-u)s_0 + u s_1 =$$

$$= (1-u)\left((1-u)r_0 + u r_1\right) + u\left((1-u)r_1 + u r_2\right) =$$

$$= (1-u)\left[(1-u)\left((1-u)p_0 + u p_1\right) + u\left((1-u)p_1 + u p_2\right)\right] +$$
$$u\left[(1-u)\left((1-u)p_1 + u p_2\right) + u\left((1-u)p_2 + u p_3\right)\right]$$

$$= (1-u)^3 p_0 + u(1-u)^2 p_1 + u(1-u)^2 p_1 + u^2(1-u)p_2 +$$
$$u(1-u)^2 p_1 + u^2(1-u)p_2 + u^2(1-u)p_2 + u^3 p_3$$

$$= (1-u)^3 p_0 + 3u(1-u)^2 p_1 + 3u^2(1-u)p_2 + u^3 p_3 = f(u)$$