

Bezier Curves

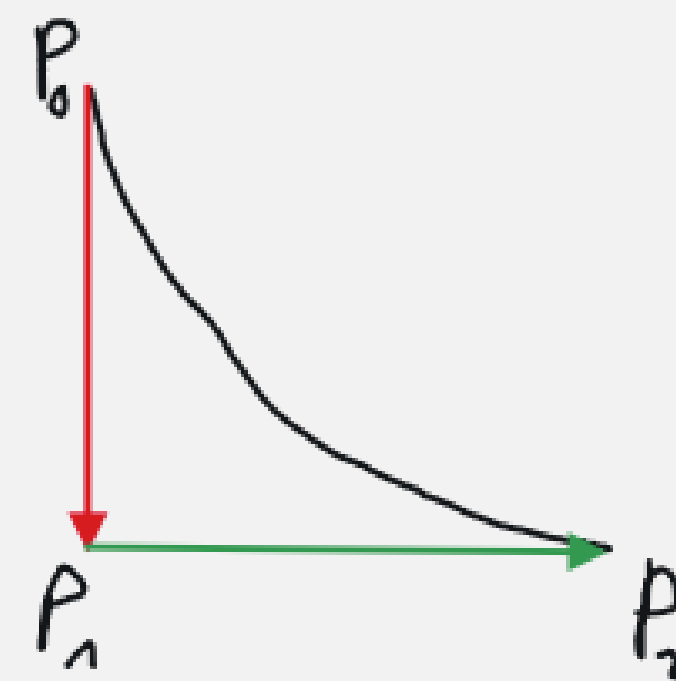
linear - first degree



$$\begin{aligned} B_L(t) &= P_0 + t(P_1 - P_0) \\ &= P_0 + tP_1 - tP_0 \\ &= (1-t)P_0 + tP_1 \end{aligned}$$

quadratic - second degree

$$\begin{aligned} B_Q(t) &= \boxed{(1-t)(B_{LP_0P_1}) + t(B_{LP_1P_2})} \quad \text{reuse already existing functions} \\ &= (1-t)((1-t)P_0 + tP_1) + t((1-t)P_1 + tP_2) \\ &= \boxed{(1-t)^2P_0 + 2(1-t)tP_1 + t^2P_2} \quad \text{performant} \end{aligned}$$



cubic - third degree

$$\begin{aligned} B_C(t) &= \boxed{(1-t)B_Q(t)_{P_0P_1P_2} + tB_Q(t)_{P_1P_2P_3}} \quad \text{reuse already existing functions} \\ &= \boxed{(1-t)^3P_0 + 3(1-t)^2tP_1 + 3(1-t)t^2P_2 + t^3P_3} \quad \text{performant} \end{aligned}$$

