

$$a^4 + a^2b + ab^3 + 2ab^2 + b^3$$

$$\begin{aligned} a^4 + a^2b + ab^3 + 2ab^2 + b^3 &= a^4 + ab^3 + a^2b + 2ab^2 + b^3 = a(a^3 + b^3) + b(a^2 + 2ab + b^2) = \\ &= a(a+b)(a^2 - ab + b^2) + b(a+b)^2 = (a+b)(a(a^2 - ab + b^2) + b(a+b)) = \\ &= (a+b)(a^3 - a^2b + ab^2 + ab + b^2) \end{aligned}$$