

(1)[5 points] Expand and simplify

$$\begin{aligned} & y^4(6-y)(5+y) \\ &= y^4(30-5y+6y-y^2) \\ &= y^4(-y^2+y+30) \\ &= -y^6+y^5+30y^4 \end{aligned}$$

(2)[5 points] Simplify

$$\begin{aligned} & u+1+\frac{u}{u+1} \\ &= \frac{u+1}{1} + \frac{u}{u+1} \\ &= \frac{(u+1)(u+1)}{u+1} + \frac{u}{u+1} \\ &= \frac{u^2+u+u+1+u}{u+1} \\ &= \frac{u^2+3u+1}{u+1} \end{aligned}$$

(3)[5 points] Factor completely

$$\begin{aligned} & x^3 + 2x^2 + x \\ &= x(x^2 + 2x + 1) \\ &= x(x+1)(x+1) \end{aligned}$$