

①

$$x\bar{y}\bar{z} + xyw + x\bar{y}\bar{z}\bar{w} = x(\bar{y}\bar{z} + yw + \cancel{\bar{y}\bar{z}\bar{w}}) =$$

$$= x(\bar{y}(\bar{z} + zw) + yw) = x(\bar{y}(\underbrace{(\bar{z} + z)}_1(\bar{z} + w)) + yw) =$$

$$= x(\bar{y}(\bar{z} + w) + yw) = x(\bar{y}\bar{z} + \bar{y}w + yw) =$$

$$\underline{x\bar{y}\bar{z} + xyw}$$