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ASSIGNMENT SOLUTION

$$\rightarrow (x+y+\bar{z})(x+\bar{y}+\bar{z})\overline{(x+y+\bar{z})}\overline{(x+\bar{y}+\bar{z})}$$
$$\rightarrow \overline{(x+y+\bar{z})}\overline{(x+\bar{y}+\bar{z})}\overline{(x+y+\bar{z})}\overline{(x+\bar{y}+\bar{z})}$$

Simplify each term using De Morgan laws:

$$\rightarrow \overline{x+y+\bar{z}} = \bar{x} \cdot \bar{y} \cdot z$$

$$\rightarrow \overline{x+\bar{y}+\bar{z}} = \bar{x} \cdot y \cdot z$$

$$\rightarrow \overline{\bar{x}+y+\bar{z}} = x \cdot \bar{y} \cdot z$$

$$\rightarrow \overline{\bar{x}+\bar{y}+\bar{z}} = x \cdot y \cdot z$$

Combine Simplified terms

$$\rightarrow (\bar{x} \cdot \bar{y} \cdot z) \cdot (\bar{x} \cdot y \cdot z) \cdot (x \cdot \bar{y} \cdot z) \cdot (x \cdot y \cdot z)$$

Factor out common term z :

$$\rightarrow z \cdot (\bar{x} \cdot \bar{y}) \cdot (\bar{x} \cdot y) \cdot (x \cdot \bar{y}) \cdot (x \cdot y)$$

Simplify the combined expression.

$$\rightarrow z \cdot (\bar{x} \cdot \bar{y} \cdot \bar{x} \cdot y \cdot x \cdot \bar{y} \cdot x \cdot y), \text{ Since } \bar{x} \cdot \bar{x} = \bar{x} \text{ and } x \cdot x = x$$

we simplify

$$\rightarrow z \cdot (\bar{x} \cdot \bar{y} \cdot y \cdot x \cdot \bar{y} \cdot y)$$

Notice that $\bar{y} \cdot y = 0$, the entire expression simplifies to:

$$\underline{\underline{z \cdot 0 = 0}}$$