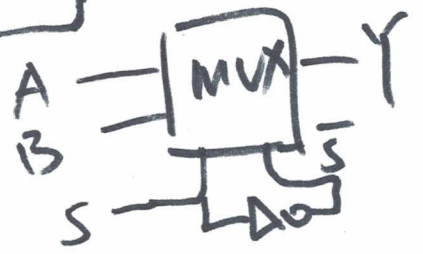
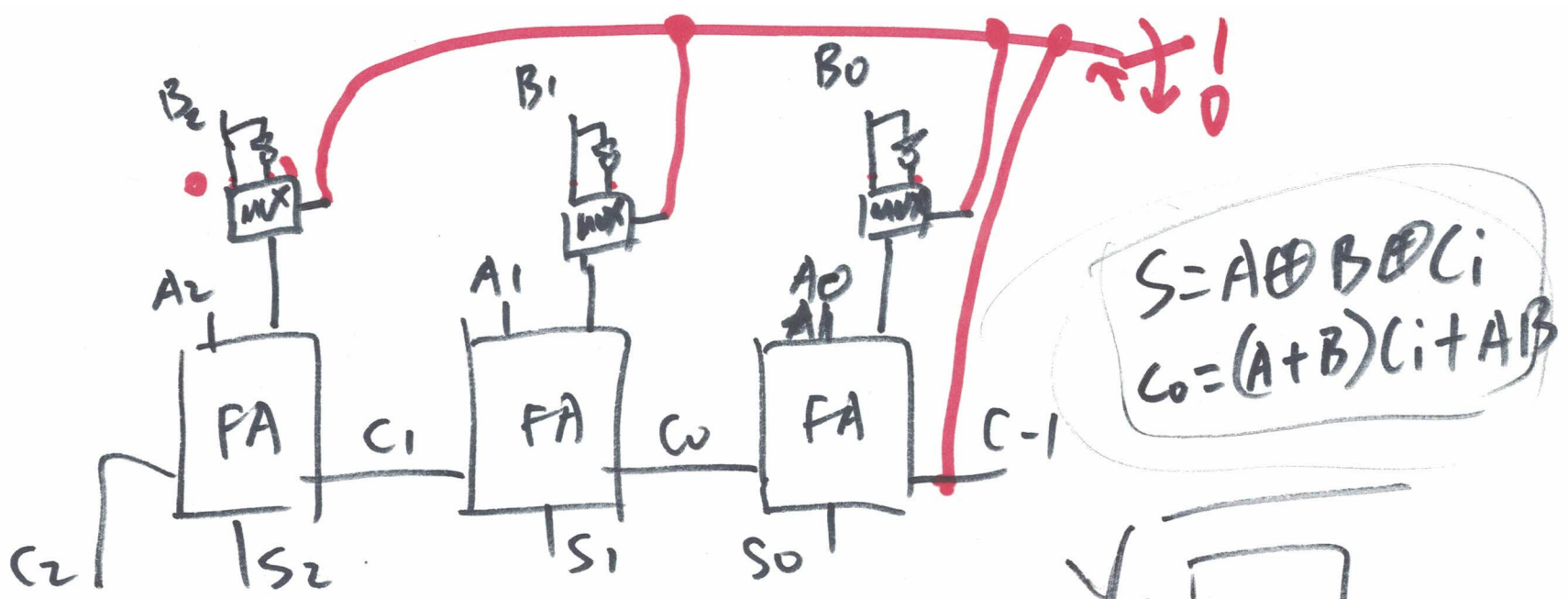


if $S=1$, $Y=B$
 if $S=0$, $Y=A$

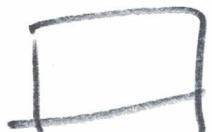


①



$$S = A \oplus B \oplus C_i$$

$$C_o = (A + B)C_i + AB$$

Y = 
 ↓
 Complex CMOS logic

$$S = A \oplus B \oplus C_i = (\bar{A}B + A\bar{B}) \oplus C_i$$

$$= \overline{\bar{A}B + A\bar{B}} C_i + (\bar{A}B + A\bar{B}) \overline{C_i}$$

$$= \overline{\bar{A}B} \cdot \overline{A\bar{B}} \cdot C_i + \bar{A}B C_i + A\bar{B} \overline{C_i}$$

$$= (A + B) \cdot (\bar{A} + \bar{B}) C_i + \bar{A}B C_i + A\bar{B} \overline{C_i}$$

$$= \bar{A} \bar{B} C_i + ABC_i + \bar{A} B C_i + A \bar{B} \overline{C_i}$$

$$\underline{C_0} = \frac{(A+B)C_i + AB}{}$$

$$\underline{C_0} = \overline{(A+B)C_i + AB}$$

$$= \overline{(A+B)C_i} \cdot \overline{AB}$$

$$= \overline{(A+B+C_i)} (\overline{A} + \overline{B})$$

$$= \overline{(A \cdot B + C_i)} (\overline{A} + \overline{B})$$

$$= \overline{A} \overline{B} + \overline{A} \overline{C_i} + \overline{B} \overline{C_i}$$

$$(A+B+C_i) \cdot \underline{C_0} = \overline{(A+B+C_i)} (\overline{A} \overline{B} + \overline{C_i}) (\overline{A} + \overline{B})$$

$$= \overline{(A \overline{B} + \overline{A} B + \overline{A} C_i + \overline{B} C_i)} (\overline{A} \overline{B} + \overline{C_i})$$

$$= \underline{A \overline{B} \overline{C_i}} + \underline{\overline{A} B \overline{C_i}} + \underline{\overline{A} \overline{B} C_i} + \overline{A \overline{B} C_i}$$

$$\text{So, } S = (A+B+C_i) \cdot \underline{C_0} + \underline{A \overline{B} C_i}$$

(3)

