$\max z = 2x_1 + x_2$

s.t. $x_1 + x_2 \leq 10$

$-x_1 + x_2 \geq 2$

$\Rightarrow$ standard form

$\max z = 2x_1 + x_2$

s.t. $x_1 + x_2 + S_1 = 10$

$x_1 - x_2 + S_2 = -2$

$\Rightarrow \max \{-x_0\}$

$\max z = 2x_1 + x_2$

$S_1 = x_0 + 10 - x_1 - x_2$

$S_2 = x_0 - 2 - x_1 + x_2$

$\Rightarrow x_0 = 2 + x_1 - x_2 + S_2$

$\Rightarrow$

$\max -2 - x_1 + x_2 - S_2$

$\max z = 2x_1 + x_2$

$S_1 = 12 + 2x_2 + S_2 \quad x_2 = 6 \cdots$

$x_0 = 2 + x_1 - x_2 + S_2 \quad x_2 = 2 \cdots \checkmark$

$\Rightarrow \Rightarrow x_2 = 2 - x_0 + x_1 + S_2$

$\Rightarrow \max -x_0$

$\max z = 2 - x_0 + 3x_1 + S_2$

$S_1 = 12 - 4 + 2x_0 - 2x_1 - 2S_2 + S_2$

$x_2 = 2 - x_0 - x_1 + S_2$

$\boxed{\text{Opt} = 0}$

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**Phase II**

$\max z = \boxed{3x_1} + S_2 + 2$

$S_1 = 8 - 2x_1 - S_2 \quad x_1 = 4 \cdots$

$S_2 = 2 + x_1 + S_2 \quad x_1 = -2 \cdots$

$\Rightarrow x_1 = 4 - \frac{1}{2}S_1 - \frac{1}{2}S_2$

$\Rightarrow \max z = -\frac{3}{2}S_1 - \frac{1}{2}S_2 + 4$

$x_1 = -\frac{1}{2}S_1 - \frac{1}{2}S_2 + 4$

$x_2 = -\frac{1}{2}S_1 + \frac{1}{2}S_2 + 6$

$\boxed{(x_1, x_2, S_1, S_2) = (4, 6, 0, 0)}$

$\boxed{\max z = 14}$

$\boxed{\text{opt} = 14}$