Superstacking Mats Formula and Example

Variables:

M_{daily} = Daily mats earned from tBTC lock
D = Total number of days (e.g., 120 days)
M_{stBTC} = Amount of stBTC minted
T_{tBTC} = Amount of tBTC required to mint 1 stBTC (1.11 tBTC)
B_{stBTC} = Mats bonus per 1 stBTC minted (30,000 mats)
N_{stBTC} = Number of times stBTC is minted during the period (assumed to be 1 if minted once)
C_{BTC} = Amount of BTC worth of Curve LP tokens
S_{Curve} = Base score for Curve LP tokens per 1 BTC worth (1,100 mats/day)
$L_{\text{multiplier}}$ = Lock multiplier based on the lock duration: 16x, 9x, 3x

Formula:

1. **Total Mats from tBTC Lock:**

$$M_{\text{tBTC}} = M_{\text{daily}} \times D$$

2. **Total Mats from stBTC Minting:**

$$M_{\text{stBTC}} = \left(\frac{M_{\text{stBTC}}}{T_{\text{tBTC}}} \right) \times B_{\text{stBTC}} \times N_{\text{stBTC}}$$

3. **Total Mats from Curve LP Tokens (with Lock Multiplier):**

$$M_{\text{Curve}} = C_{\text{BTC}} \times S_{\text{Curve}} \times D \times L_{\text{multiplier}}$$

4. **Final Total Mats:**

$$M_{\text{total}} = M_{\text{tBTC}} + M_{\text{stBTC}} + M_{\text{Curve}}$$

Example Calculation

Using the example of 1.11 tBTC locked for 120 days, minting 1 stBTC, and holding 1 BTC worth of Curve LP tokens locked for 9 months (using the 16x multiplier):

Given:

$$\begin{aligned} M_{\text{daily}} &= 16{,}000 \text{ mats/day} \\ D &= 120 \text{ days} \\ M_{\text{stBTC}} &= 1 \text{ stBTC} \\ T_{\text{tBTC}} &= 1.11 \text{ tBTC} \\ B_{\text{stBTC}} &= 30{,}000 \text{ mats/stBTC} \\ C_{\text{BTC}} &= 1 \text{ BTC} \\ S_{\text{Curve}} &= 1{,}100 \text{ mats/day per 1 BTC} \\ L_{\text{multiplier}} &= 16 \text{ (for 9 months lock)} \end{aligned}$$

1. **Total Mats from tBTC Lock:**

$$M_{\text{tBTC}} = 16{,}000 \times 120 = 1{,}920{,}000 \text{ mats}$$

2. **Total Mats from stBTC Minting:**

$$M_{\text{stBTC}} = \left(\frac{1}{1.11}\right) \times 30{,}000 \times 1 = 27{,}027 \text{ mats}$$

3. **Total Mats from Curve LP Tokens (with Lock Multiplier):**

$$M_{\text{Curve}} = 1 \times 1{,}100 \times 120 \times 16 = 2{,}112{,}000 \text{ mats}$$

4. **Final Total Mats:**

$$M_{\text{total}} = 1{,}920{,}000 + 27{,}027 + 2{,}112{,}000 = 4{,}059{,}027 \text{ mats}$$