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$$49X + 106Y \overset{*}{=} 50$$

Step 1; $\gcd(\underset{7^2}{49}, \underset{2\cdot 53}{106}) = 1$, so first find

a solution to

$$49X + 106Y = 1$$

using the Extended Euclidean Algorithm,

$$106\, y_i + 49\, x_i = r_i$$

y_i	x_i	r_i	q_i
1	0	106	—
0	1	49	—
1	−2	8	2
−6	13	1	6

so $\quad 49 \cdot 13 + 106(-6) = 1$ ✓

Step 2: Hence $(x_0, y_0) = 50(13, -6) = (650, -300)$ is a particular solution to Eq $*$.

The general solution is

$$\{(650 - k\cdot 106,\ -300 + k\cdot 49) : k \in \mathbb{Z}\}.$$