How to Solve $mx + ny + kz = c$

**Step 1:** Fix one variable (say $z$) and re-write the equation as

(1) \[ mx + ny = c - kz. \]

Use the GCD-criterion to derive from (1) an auxiliary equation in $z$ and $w$ of the form

(2) \[ kz + gw = c, \]

in which $g = \gcd(m, n)$.

**Step 2:** Solve the auxiliary equation (2) to get an expression for $z$ in terms of a parameter $t$.

**Step 3:** Substitute this expression for $z$ in the original equation and solve for $x$ and $y$, treating $t$ as fixed. (Introduce a new parameter $s$ here.)

**Step 4:** Collect the equations for $x$, $y$ and $z$ together.

**Step 5:** If applicable, analyze the constraints on $x$, $y$ and $z$. 