ROMANIAN MATHEMATICAL MAGAZINE

If $x, y, z \in \mathbb{R}$ such that $3x + y + 2z \geq 3$ and $-x + 2y + 4z \geq 5$, then find the $min(x + 2y + 4z)$

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Solution by Mohamed Amine Ben Ajiba-Tanger-Morocco

We have $x + 2y + 4z = \frac{4}{7}(3x + y + 2z) + \frac{5}{7}(-x + 2y + 4z) \geq \frac{4}{7}.3 + \frac{5}{7}.5 = \frac{37}{7}$,

so the minimum value of $x + 2y + 4z$ **is** $\frac{37}{7}$, **for** $x = \frac{1}{7}, y = \frac{18}{7} - 2t, z = t, \ \ t \in \mathbb{R}$.