Lineare Gleichungssysteme lösen

Aufgabe 1:
Löse das Gleichungssystem

1) $\left|\begin{array}{l} 12x - 4y = 52 \\ 20x + 4y = 76 \end{array}\right.$

2) $\left|\begin{array}{l} 4x + 4y = -32 \\ 16x - 4y = -28 \end{array}\right.$

3) $\left|\begin{array}{l} 3x + 3y = 3 \\ 6x - 3y = -30 \end{array}\right.$

4) $\left|\begin{array}{l} -9x - 3y = -3 \\ -12x + 3y = 24 \end{array}\right.$

5) $\left|\begin{array}{l} 20x + 5y = -70 \\ 10x - 5y = -50 \end{array}\right.$

6) $\left|\begin{array}{l} 12x - 3y = -12 \\ 9x + 3y = -30 \end{array}\right.$

Lösung:

1) I + II: $32x = 128$ | : 32
$x = 4$
Einsetzen in 1. Gleichung
$12 \cdot 4 - 4y = 52$ | T
$48 - 4y = 52$ | -48
$-4y = 4$ | : (-4)
$y = -1$
$L = \{ (4|-1) \}$

2) I + II: $20x = -60$ | : 20
$x = -3$
Einsetzen in 1. Gleichung
$4 \cdot (-3) + 4y = -32$ | T
$-12 + 4y = -32$ | + 12
$4y = -20$ | : 4
$y = -5$
$L = \{ (-3|-5) \}$

3) I + II: $9x = -27$ | : 9
$x = -3$
Einsetzen in 1. Gleichung
$3 \cdot (-3) + 3y = 3$ | T
$-9 + 3y = 3$ | + 9
$3y = 12$ | : 3
$y = 4$
$L = \{ (-3|4) \}$

4) I + II: $-21x = 21$ | : (-21)
$x = -1$
Einsetzen in 1. Gleichung
$-9 \cdot (-1) - 3y = -3$ | T
$9 - 3y = -3$ | -9
$-3y = -12$ | : (-3)
$y = 4$
$L = \{ (-1|4) \}$

5) I + II: $30x = -120$ | : 30
$x = -4$
Einsetzen in 1. Gleichung
$20 \cdot (-4) + 5y = -70$ | T
$-80 + 5y = -70$ | + 80
$5y = 10$ | : 5
$y = 2$
$L = \{ (-4|2) \}$

6) I + II: $21x = -42$ | : 21
$x = -2$
Einsetzen in 1. Gleichung
$12 \cdot (-2) - 3y = -12$ | T
$-24 - 3y = -12$ | + 24
$-3y = 12$ | : (-3)
$y = -4$
$L = \{ (-2|-4) \}$