Exercicis de sistemes d'equacions

Discutir i resoldre aquests sistemes d'equacions:

1) $\left.\begin{array}{r} 3x+2y+8z=4 \\ x+y+z=1 \\ 2x+3y-3z=1 \end{array}\right\}$

2) $\left.\begin{array}{r} x+3y-6z=1 \\ x+y+2z=1 \\ 9x+11y+10z=9 \end{array}\right\}$

3) $\left.\begin{array}{r} 3x-5y+11z=-6 \\ 2x-3y+7z=-4 \\ x-y+3z=-2 \end{array}\right\}$

4) $\left.\begin{array}{r} 2x-y-4z=4 \\ x-3z=0 \\ 3x-3y+z=8 \end{array}\right\}$

5) $\left.\begin{array}{r} 2x+5y-6z=11 \\ x+y-2z=3 \\ 2x+8y-8z=15 \end{array}\right\}$

6) $\left.\begin{array}{r} 3x+5y-8z=-10 \\ 5x+2y-4z=-4 \\ 2x-3y+4z=5 \end{array}\right\}$

7) $\left.\begin{array}{r} x-3y=-2 \\ 3x-2y-7z=-13 \\ x+4y-7z=-9 \end{array}\right\}$

8) $\left.\begin{array}{r} 2x+9y-7z=15 \\ x+8y-3z=3 \\ x-6y-5z=19 \end{array}\right\}$

9) $\left.\begin{array}{r} x-2y=1 \\ 2x+5y+3z=-1 \\ 8x-4y-z=-6 \end{array}\right\}$

10) $\left.\begin{array}{r} x-y-z=-2 \\ x+y-11z=-12 \\ x-3y+9z=8 \end{array}\right\}$

11) $\left.\begin{array}{r} 5x+2y-5z=-10 \\ 4x+y-3z=-2 \\ 3x-z=5 \end{array}\right\}$

12) $\left.\begin{array}{r} x-2z=-10 \\ 2x+3y-3z=-7 \\ 6x+5y-z=-1 \end{array}\right\}$

13) $\left.\begin{array}{r} x+7y-4z=-18 \\ 2x+y=1 \\ x-2z=-5 \end{array}\right\}$

14) $\left.\begin{array}{r} x-4y-2z=11 \\ 2x-2y-3z=15 \\ 3x+5y-4z=14 \end{array}\right\}$

15) $\left.\begin{array}{r} x+3y+z=3 \\ x+4y-2z=15 \\ 4x+3y-5z=12 \end{array}\right\}$

16) $\left.\begin{array}{r} x-6y=17 \\ 3x-5y+6z=13 \\ x+7y+6z=-19 \end{array}\right\}$

17) $\left.\begin{array}{r} x+8y+8z=3 \\ 2x-8y+z=-3 \\ x+y-4z=8 \end{array}\right\}$

18) $\left.\begin{array}{r} 3x+y-8z=-8 \\ 4x+y-10z=-12 \\ 5x+y-12z=-16 \end{array}\right\}$

19) $\left.\begin{array}{r} x+3y+z=1 \\ x+2z=9 \\ 3y-z=-11 \end{array}\right\}$

20) $\left.\begin{array}{r} x+4y-11z=-10 \\ 2x+y-z=-6 \\ x-3y+10z=4 \end{array}\right\}$

Solucions:

1) Sistema compatible indeterminat. $x = -6\lambda + 2,\ y = 5\lambda - 1,\ z = \lambda,\quad \lambda \in \Re$
2) Sistema compatible indeterminat. $x = -6\lambda + 1,\ y = 4\lambda,\ z = \lambda,\quad \lambda \in \Re$
3) Sistema compatible indeterminat. $x = -2\lambda - 2,\ y = \lambda,\ z = \lambda,\quad \lambda \in \Re$
4) Sistema compatible determinat. $x = -3,\ y = -6,\ z = -1$
5) Sistema incompatible.
6) Sistema incompatible.
7) Sistema compatible indeterminat. $x = 3\lambda - 5,\ y = \lambda - 1,\ z = \lambda,\quad \lambda \in \Re$
8) Sistema incompatible.
9) Sistema compatible determinat. $x = -1,\ y = -1,\ z = 2$
10) Sistema compatible indeterminat. $x = 6\lambda - 7,\ y = 5\lambda - 5,\ z = \lambda,\quad \lambda \in \Re$
11) Sistema incompatible.
12) Sistema compatible determinat. $x = -2,\ y = 3,\ z = 4$
13) Sistema compatible determinat. $x = 1,\ y = -1,\ z = 3$
14) Sistema compatible determinat. $x = 5,\ y = -1,\ z = -1$
15) Sistema compatible determinat. $x = -3,\ y = 3,\ z = -3$
16) Sistema incompatible.
17) Sistema compatible determinat. $x = 3,\ y = 1,\ z = -1$
18) Sistema compatible indeterminat. $x = 2\lambda - 4,\ y = 2\lambda + 4,\ z = \lambda,\quad \lambda \in \Re$
19) Sistema incompatible.
20) Sistema compatible indeterminat. $x = -\lambda - 2,\ y = 3\lambda - 2,\ z = \lambda,\quad \lambda \in \Re$