

Resoleu els següents sistemes d'equacions lineals:

$$a) \begin{cases} 6x + 4y - z = 3 \\ x + 2y + 4z = -2 \\ 5x + 4y = 0 \end{cases}$$

$$b) \begin{cases} x + y + z = 2 \\ 4x + y = 4 \\ -x + 3y + 2z = 8 \end{cases}$$

$$c) \begin{cases} 4x + 9y + 13z = 3 \\ -x + 3y + 24z = 17 \\ 2x + 6y + 14z = 6 \end{cases}$$

$$d) \begin{cases} x + y - 2z = 7 \\ 2x - 3y - 2z = 0 \\ x - 4y = -7 \end{cases}$$

$$e) \begin{cases} x + y + z = 2 \\ 4x + 2y + 3z = -1 \\ 3x + y + 2z = 4 \end{cases}$$

$$f) \begin{cases} 2x + 3y - z = 3 \\ x + 2y + 3z = -2 \\ x + y - 4z = 5 \end{cases}$$

Solució:

a)

Obrim el *Menú Ecuaciones*:

MENU **X,θ,T** **F1** **F2**

Math Rad Norm1 d/c a+bi
 $a_n X + b_n Y + C_n Z = d_n$

	a	b	c	d
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0

SOLVE **DELETE** **CLEAR** **EDIT**

Introduïm els coeficients i els termes independents.

Math Rad Norm1 d/c a+bi
 $a_n X + b_n Y + C_n Z = d_n$

	a	b	c	d
1	6	4	-1	3
2	1	2	4	-2
3	5	4	0	0

SOLVE **DELETE** **CLEAR** **EDIT**

Math Rad Norm1 d/c a+bi
 $a_n X + b_n Y + C_n Z = d_n$

X	4
Y	-5
Z	1

REPEAT

El sistema és compatible determinat.

La solució és: $\begin{cases} x = 4 \\ y = -5 \\ z = 1 \end{cases}$

b)

<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + c_n Z = d_n$ <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 25%; text-align: center;">a</th> <th style="width: 25%; text-align: center;">b</th> <th style="width: 25%; text-align: center;">c</th> <th style="width: 20%; text-align: center;">d</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: right;">2</td> <td style="text-align: center;">4</td> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: center;">-1</td> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">8</td> </tr> </tbody> </table> <div style="text-align: right; margin-top: 5px;">8</div> <div style="border-top: 1px solid black; margin-top: 5px;"> SOLVE DELETE CLEAR EDIT </div> </div>		a	b	c	d	1	1	1	1	2	2	4	1	0	4	3	-1	3	2	8	<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + c_n Z = d_n$ <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 5%; text-align: right;">X</td> <td style="width: 95%; text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">Y</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: right;">Z</td> <td style="text-align: center;">-2</td> </tr> </table> <div style="text-align: right; margin-top: 5px;">0</div> <div style="border-top: 1px solid black; margin-top: 5px;"> REPEAT </div> </div>	X	0	Y	4	Z	-2
	a	b	c	d																							
1	1	1	1	2																							
2	4	1	0	4																							
3	-1	3	2	8																							
X	0																										
Y	4																										
Z	-2																										

El sistema és compatible determinat.

La solució és:
$$\begin{cases} x = 0 \\ y = 4 \\ z = -2 \end{cases}$$

c)

<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + c_n Z = d_n$ <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 25%; text-align: center;">a</th> <th style="width: 25%; text-align: center;">b</th> <th style="width: 25%; text-align: center;">c</th> <th style="width: 20%; text-align: center;">d</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">1</td> <td style="text-align: center;">4</td> <td style="text-align: center;">9</td> <td style="text-align: center;">13</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: right;">2</td> <td style="text-align: center;">-1</td> <td style="text-align: center;">3</td> <td style="text-align: center;">24</td> <td style="text-align: center;">17</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">6</td> <td style="text-align: center;">14</td> <td style="text-align: center;">6</td> </tr> </tbody> </table> <div style="text-align: right; margin-top: 5px;">6</div> <div style="border-top: 1px solid black; margin-top: 5px;"> SOLVE DELETE CLEAR EDIT </div> </div>		a	b	c	d	1	4	9	13	3	2	-1	3	24	17	3	2	6	14	6	<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + c_n Z = d_n$ <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 5%; text-align: right;">X</td> <td style="width: 95%; text-align: center;">10</td> </tr> <tr> <td style="text-align: right;">Y</td> <td style="text-align: center;">-7</td> </tr> <tr> <td style="text-align: right;">Z</td> <td style="text-align: center;">2</td> </tr> </table> <div style="text-align: right; margin-top: 5px;">10</div> <div style="border-top: 1px solid black; margin-top: 5px;"> REPEAT </div> </div>	X	10	Y	-7	Z	2
	a	b	c	d																							
1	4	9	13	3																							
2	-1	3	24	17																							
3	2	6	14	6																							
X	10																										
Y	-7																										
Z	2																										

El sistema és compatible determinat.

La solució és:
$$\begin{cases} x = 10 \\ y = -7 \\ z = 2 \end{cases}$$

d)

<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + c_n Z = d_n$ <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 25%; text-align: center;">a</th> <th style="width: 25%; text-align: center;">b</th> <th style="width: 25%; text-align: center;">c</th> <th style="width: 20%; text-align: center;">d</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">-2</td> <td style="text-align: center;">7</td> </tr> <tr> <td style="text-align: right;">2</td> <td style="text-align: center;">2</td> <td style="text-align: center;">-3</td> <td style="text-align: center;">-2</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">-4</td> <td style="text-align: center;">0</td> <td style="text-align: center;">-7</td> </tr> </tbody> </table> <div style="text-align: right; margin-top: 5px;">-7</div> <div style="border-top: 1px solid black; margin-top: 5px;"> SOLVE DELETE CLEAR EDIT </div> </div>		a	b	c	d	1	1	1	-2	7	2	2	-3	-2	0	3	1	-4	0	-7	<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + c_n Z = d_n$ <p style="text-align: center; margin-top: 5px;">Soluciones Infinitas</p> <div style="background-color: black; color: white; padding: 5px; margin: 5px 0;"> $X = \frac{21}{5} + \frac{8}{5}Z$ </div> <div style="margin: 5px 0;"> $Y = \frac{14}{5} + \frac{2}{5}Z$ </div> <div style="border-top: 1px solid black; margin-top: 5px;"> REPEAT </div> </div>
	a	b	c	d																	
1	1	1	-2	7																	
2	2	-3	-2	0																	
3	1	-4	0	-7																	

El sistema és compatible indeterminat.

La solució és:
$$\begin{cases} x = \frac{21}{5} + \frac{8}{5}\alpha \\ y = \frac{14}{5} + \frac{2}{5}\alpha \\ z = \alpha \end{cases}$$

e)

<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + C_n Z = d_n$ <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 25%; text-align: center;">a</th> <th style="width: 25%; text-align: center;">b</th> <th style="width: 25%; text-align: center;">c</th> <th style="width: 20%; text-align: center;">d</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: right;">2</td> <td style="text-align: center;">4</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">-1</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">4</td> </tr> </tbody> </table> <div style="text-align: right; margin-top: 5px;">4</div> <div style="border-top: 1px solid black; margin-top: 5px;"> SOLVE DELETE CLEAR EDIT </div> </div>		a	b	c	d	1	1	1	1	2	2	4	2	3	-1	3	3	1	2	4	<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + C_n Z = d_n$ <p style="font-size: large; text-align: center;">Sin solución</p> <div style="text-align: right; margin-top: 5px;">REPEAT</div> </div>
	a	b	c	d																	
1	1	1	1	2																	
2	4	2	3	-1																	
3	3	1	2	4																	

El sistema és incompatible.

f)

<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + C_n Z = d_n$ <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 25%; text-align: center;">a</th> <th style="width: 25%; text-align: center;">b</th> <th style="width: 25%; text-align: center;">c</th> <th style="width: 20%; text-align: center;">d</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">-1</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: right;">2</td> <td style="text-align: center;">1</td> <td style="text-align: center;">2</td> <td style="text-align: center;">3</td> <td style="text-align: center;">-2</td> </tr> <tr> <td style="text-align: right;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> <td style="text-align: center;">-4</td> <td style="text-align: center;">5</td> </tr> </tbody> </table> <div style="text-align: right; margin-top: 5px;">5</div> <div style="border-top: 1px solid black; margin-top: 5px;"> SOLVE DELETE CLEAR EDIT </div> </div>		a	b	c	d	1	2	3	-1	3	2	1	2	3	-2	3	1	1	-4	5	<div style="border: 1px solid black; padding: 2px;"> Math Rad Norm1 d/c a+bi $a_n X + b_n Y + C_n Z = d_n$ <p style="font-size: large; text-align: center;">Soluciones Infinitas</p> <div style="text-align: center; margin-top: 5px;"> $X = 12 + 11Z$ $Y = -7 - 7Z$ $Z = Z$ </div> <div style="text-align: right; margin-top: 5px;">REPEAT</div> </div>
	a	b	c	d																	
1	2	3	-1	3																	
2	1	2	3	-2																	
3	1	1	-4	5																	

El sistema és compatible indeterminat.

La solució és:
$$\begin{cases} x = 12 + 11\alpha \\ y = -7 - 7\alpha \\ z = \alpha \end{cases}$$