

3R #19

$$D = \det \begin{pmatrix} (1+i) - (-1+5i) & 2+5i-3 \\ 2i & 2+3i \\ 1+i & 2 \end{pmatrix} = 1-i$$

$$D_x = \det \begin{pmatrix} 2 - (6+9i) & 2+3i \\ 1 & 2 \\ 3 & 2 \end{pmatrix} = -4-9i$$

$$D_y = \det \begin{pmatrix} (6i) - (1+i) & 1 \\ 2i & 1 \\ 1+i & 3 \end{pmatrix} = -1+5i$$

$$x = \frac{-4-9i}{1-i} \cdot \frac{(1+i)}{(1+i)} = \frac{-4-4i-9i+9}{1+1}$$

$$x = \frac{5-13i}{2} = \frac{5}{2} - \frac{13}{2}i$$

$$y = \frac{-1+5i}{1-i} \cdot \frac{1+i}{1+i}$$

$$= \frac{-1-i+5i-5}{2}$$

$$= -3+2i$$

$$\#8 \left(\frac{1+i}{1-i} \right)^{2011} = a - 1i$$

$$\frac{1+i}{1-i} \cdot \frac{1+i}{1+i} = \frac{1+2i-1}{2} = i$$

$$i^{2011} = i^{2008+3} = \frac{i^{2008}}{1} \cdot i^3$$

$$0 + (-1)i = -i$$

HW quiz 8/30

Solve for x and y .

$$\begin{cases} ix + y = 4 \\ 2x - (1+i)y = i \end{cases}$$

3x3 systems

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$$\begin{cases} x + y = -1 \\ x + z = 4 \\ y + z = 1 \end{cases}$$

$$D = \det \begin{pmatrix} 1 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 1 \end{pmatrix} = (0+0+0) - (0+1+1) = -2$$

$$D_x = \det$$

$$(0 + 1 + 0) - (0 - 1 + 4)$$

-1	1	0	-1	1
4	0	1	4	0
1	1	1	1	1

$$= -2$$

$$x = \frac{-2}{-2} = 1$$

$$D_y = \det$$

$$(4 + 0 + 0) - (0 + 1 - 1)$$

1	-1	0	1	-1
1	1	1	4	4
0	1	1	0	1

$$= 4$$

$$y = \frac{4}{-2} = -2$$

$$y + z = 1$$

$$-2 + z = 1$$

$$z = +3$$

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$$D = \det \begin{pmatrix} 1 & 2 & 1 & 1 & 2 \\ 2 & 1 & 2 & 2 & 1 \\ 1 & 2 & k & 1 & 2 \end{pmatrix} = (k+4+4) - (1+4+4k) = -3k+3$$

$$D = -3k+3 = 0$$

$$-3k = -3$$

$$\boxed{k=1}$$

$$\begin{cases} x + 2y + z = 0 \\ 2x + y + 2z = 1 \\ x + 2y + z = 2 \end{cases} \begin{matrix} \leftarrow \\ \leftarrow \end{matrix} \begin{matrix} \text{parallel} \\ \text{planes} \\ \therefore \text{no} \\ \text{solutions} \end{matrix}$$

Gaussian Elimination

$$\begin{pmatrix} 1 & 2 & 1 & 0 \\ 2 & 1 & 2 & 1 \\ 1 & 2 & 1 & 2 \\ -1 & -2 & -1 & 0 \end{pmatrix} \rightarrow \begin{pmatrix} 0 & 0 & 0 & 2 \end{pmatrix}$$

$0x + 0y + 0z = 2$
NO SOLUTION

#29 (again!) Gaussian Elimination ← K.F. Gauss

$$\begin{pmatrix} 1 & 1 & 0 & -1 \\ 1 & 0 & 1 & 4 \\ 0 & 1 & 1 & 1 \end{pmatrix} \rightarrow \begin{pmatrix} 1 & 1 & 0 & -1 \\ 0 & -1 & 1 & 5 \\ 0 & 1 & 1 & 1 \end{pmatrix}$$

Row
Echelon
Form

$$\begin{pmatrix} 1 & 1 & 0 & -1 \\ 0 & -1 & 1 & 5 \\ 0 & 0 & 2 & 6 \end{pmatrix}$$

$$2z = 6$$

$$z = 3$$

$$-y + 3 = 5$$

$$y = -2$$

$$x - 2 = -1$$

$$x = 1$$

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$$D = \det \begin{pmatrix} k & 4 & 3 & k & 4 \\ 3 & 6 & -2 & 3 & 6 \end{pmatrix} = -44 + 22k$$

$-8 + 18 + 18k - (36 + 18 - 4k)$

$$= 10 + 18k - 54 + 4k$$

$$D = -44 + 22k = 0$$

$$k = 2$$

HW 3R # 2 b-f

3 b

4 b

Review # 9 (again)