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7-3 Solving Multivariable Systems of Equations

Rules:
1. We may interchange two rows
2. We may multiply a row by a non-zero number
3. We may add a multiple of one equation to another

$5(4x-3y=10)\rightarrow$
$4(5x+2y=8)\rightarrow$

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Ex 1 Solve:

$2x+y+3z=-8$
$x-2y+z=-4$
$3x+4y+2z=3$

$2x+1+-15=-8 \rightarrow 2x-14=-8 \rightarrow 2x=6$
$x=3$

$-3x+6y-3z=12$
$-2x+4y-2z=8$
$x-2y+z=-4$
$2x+y+3z=-8$
$3x+4y+2z=3$

$(3,1,-5)$

$x-2y+z=-4$
$5y+z=0$
$10y-z=15$
$15y=15$ $y=1$ $z=-5$
$5+z=0$

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Ex 2 Solve:

$x+y+z=6$
$3x-y+5z=-8$
$2x+2y-3z=7$

$-2 \rightarrow -2x-2y-2z=-12$
$-3 \rightarrow -3x-3y-3z=-18$

$-4y+2z=-26$
$-5z=-5$
$z=1$

$-4y+2=-26$
$-4y=-28$
$y=7$

$x+7+1=6$
$x+8=6$
$x=-2$
$(-2,7,1)$

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No solution - inconsistent

Infinite solutions - dependent

Ex 3. Solve

$x+y-3z=-1$
$y-z=0$
$-x+2y=1$

$+$ Infinite Solutions

$y-z=0 \rightarrow 3y-3z=0$
$3y-3z=0 \rightarrow 3y-3z=0$
$0=0$

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Homework
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