```
> restart;
  with(LinearAlgebra):
> A,b  := RandomMatrix(3,3), RandomVector(3);
```

$$A, b := \begin{bmatrix} 27 & 99 & 92 \\ 8 & 29 & -31 \\ 69 & 44 & 67 \end{bmatrix}, \begin{bmatrix} -32 \\ -74 \\ -4 \end{bmatrix}$$

```
> x := LinearSolve(A,b);
```

$$x := \begin{bmatrix} -\dfrac{54207}{163622} \\ -\dfrac{207597}{163622} \\ \dfrac{182389}{163622} \end{bmatrix}$$

```
> p := prevprime(10^4);
```

$$p := 9973$$

Solve $A \cdot x = b$ modulo p, p^2, p^3, ...

```
> u := x mod p;
```

$$u := \begin{bmatrix} 4427 \\ 6677 \\ 1922 \end{bmatrix}$$

```
> y := iratrecon(u,p);
```

$$y := FAIL$$

```
> u := x mod p^2;
```

$$u := \begin{bmatrix} 60351050 \\ 78613863 \\ 95533289 \end{bmatrix}$$

```
> y := iratrecon(u,p^2);
```

$$y := FAIL$$

```
> u := x mod p^3;
```

$$u := \begin{bmatrix} 432416140013 \\ 251614797504 \\ 410967804788 \end{bmatrix}$$

```
> y := iratrecon(u,p^3);
```

$$y := \begin{bmatrix} -\dfrac{54207}{163622} \\[2mm] -\dfrac{207597}{163622} \\[2mm] \dfrac{182389}{163622} \end{bmatrix}$$

> `A.y-b;`

$$\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

> `d := ilcm( denom(y[1]), denom(y[2]), denom(y[3]) );`

$$d := 163622$$

> `A.(d*y)-(d*b);`

$$\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$

> `?iratrecon`