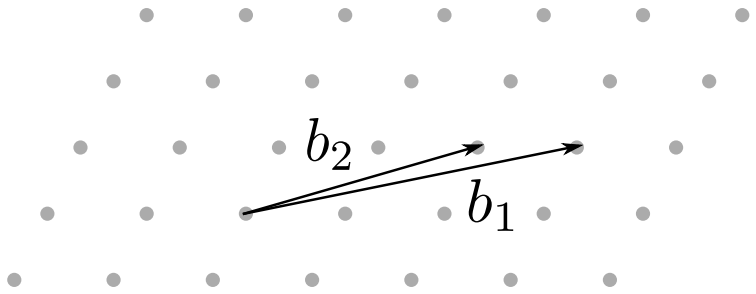
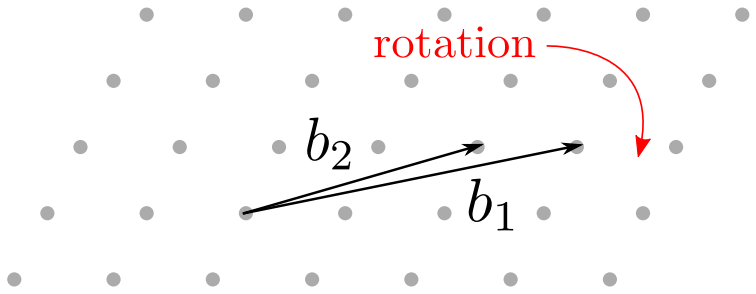
Lagrange-Gauss algorithm (over $\mathbb{Z}$)



$$M = \begin{pmatrix} 10 & 7 \\ 2 & 2 \end{pmatrix}$$

Lagrange-Gauss algorithm (over $\mathbb{Z}$)

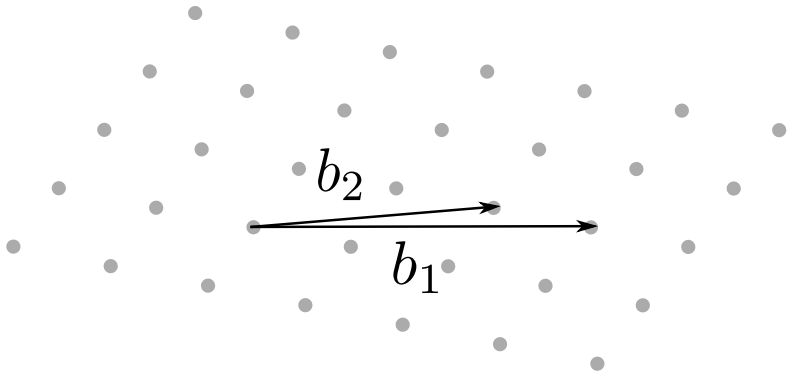


rotation

$$M = \begin{pmatrix} 10 & 7 \\ 2 & 2 \end{pmatrix}$$

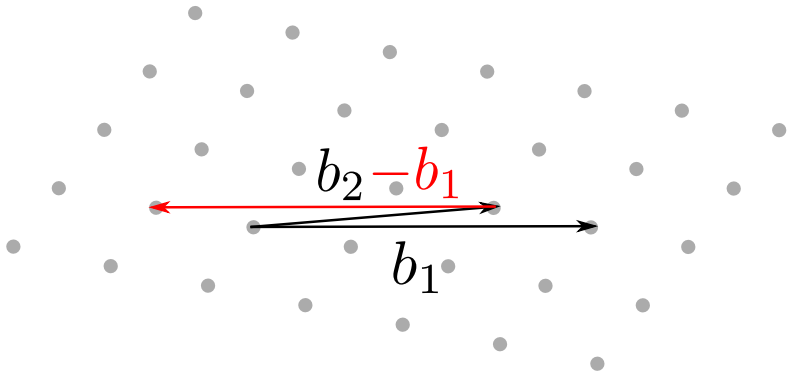
Compute QR factorization

Lagrange-Gauss algorithm (over $\mathbb{Z}$)



$$M = \begin{pmatrix} 10.2 & 7.3 \\ 0 & 0.6 \end{pmatrix}$$

Lagrange-Gauss algorithm (over $\mathbb{Z}$)

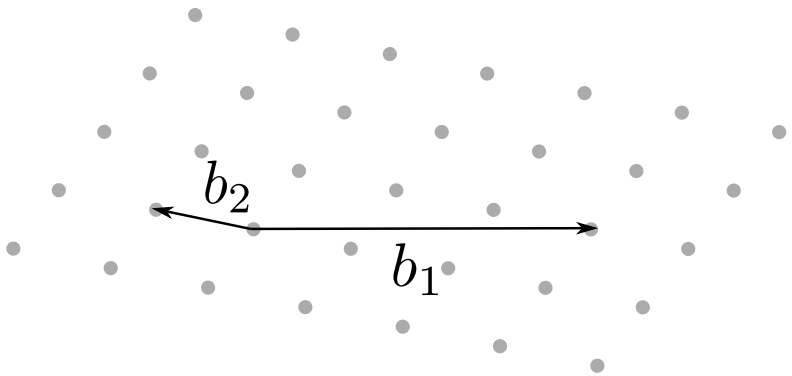


reduce b_2 with b_1

$$M = \begin{pmatrix} 10.2 & 7.3 \\ 0 & 0.6 \end{pmatrix}$$

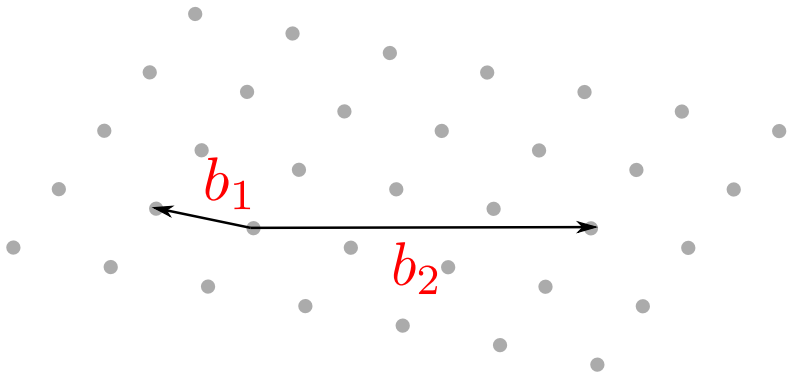
"Euclidean division" (over $\mathbb{R}$)
of 7.3 by 10.2

Lagrange-Gauss algorithm (over $\mathbb{Z}$)



$$M = \begin{pmatrix} 10.2 & -2.9 \\ 0 & 0.6 \end{pmatrix}$$

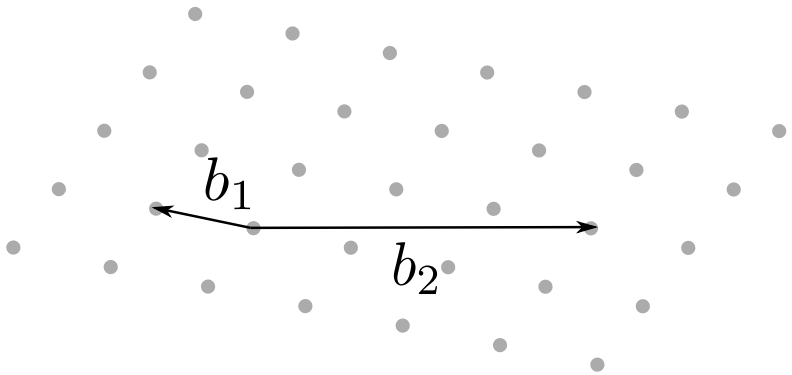
Lagrange-Gauss algorithm (over $\mathbb{Z}$)



swap

$$M = \begin{pmatrix} -2.9 & 10.2 \\ 0.6 & 0 \end{pmatrix}$$

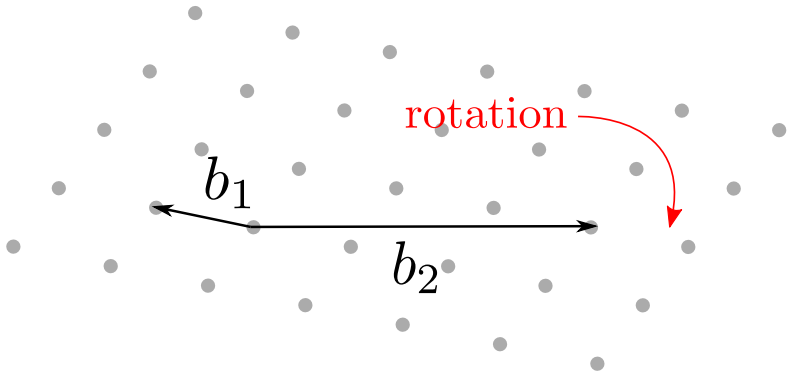
Lagrange-Gauss algorithm (over $\mathbb{Z}$)



start again

$$M = \begin{pmatrix} -2.9 & 10.2 \\ 0.6 & 0 \end{pmatrix}$$

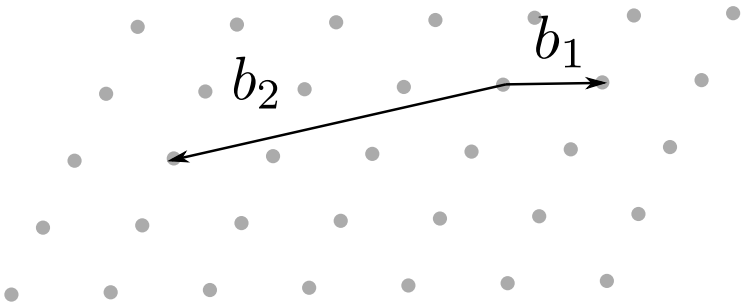
Lagrange-Gauss algorithm (over $\mathbb{Z}$)



rotation

$$M = \begin{pmatrix} -2.9 & 10.2 \\ 0.6 & 0 \end{pmatrix}$$

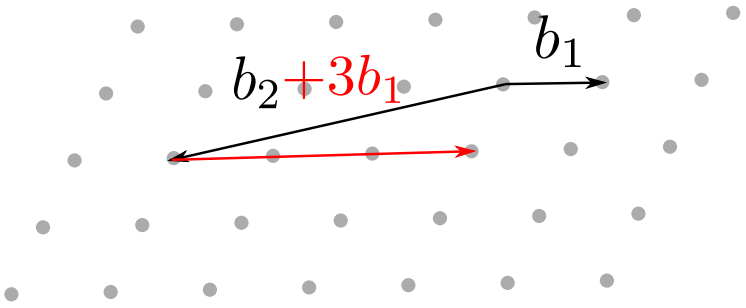
Lagrange-Gauss algorithm (over $\mathbb{Z}$)



rotation

$$M = \begin{pmatrix} 3 & -10 \\ 0 & -2 \end{pmatrix}$$

Lagrange-Gauss algorithm (over $\mathbb{Z}$)

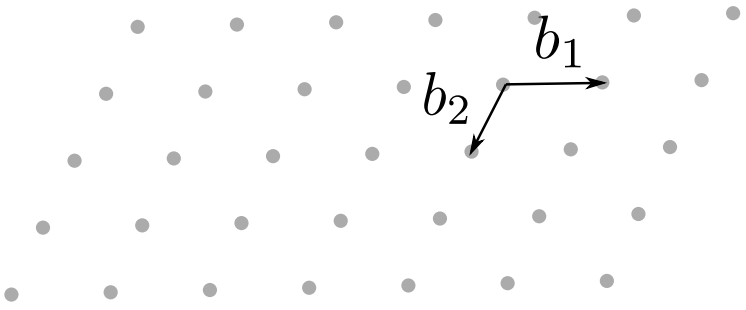


reduce b_2 with b_1

$$M = \begin{pmatrix} 3 & -10 \\ 0 & -2 \end{pmatrix}$$

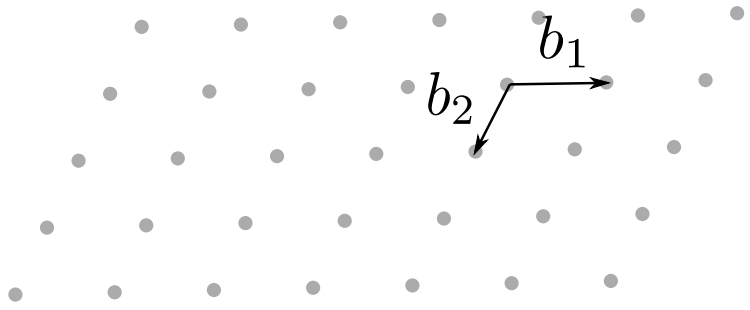
"Euclidean division" (over $\mathbb{R}$)
of -10 by 3

Lagrange-Gauss algorithm (over $\mathbb{Z}$)



$$M = \begin{pmatrix} 3 & -1 \\ 0 & -2 \end{pmatrix}$$

Lagrange-Gauss algorithm (over $\mathbb{Z}$)



$$M = \begin{pmatrix} 3 & -1 \\ 0 & -2 \end{pmatrix}$$

For Lagrange-Gauss algorithm over R, we need

- rotation (i.e., QR factorization)
- Euclidean division