

# GCD (Euclidean algorithm)

## EUCLEDIAN ALGORITHM

1)  $\gcd(25, 60)$

| $q$ | $r_1$ | $r_2$ | $r$ |
|-----|-------|-------|-----|
|     | 60    | 25    |     |

$$\begin{array}{r} 2 \leftarrow q \\ 25 \overline{) 60} \\ \underline{-50} \\ 10 \leftarrow r \end{array}$$



## EUCLEDIAN ALGORITHM

1)  $\gcd(25, 60)$

| $q$ | $r_1$ | $r_2$ | $r$ |
|-----|-------|-------|-----|
| 2   | 60    | 25    | 10  |
| 2   | 25    | 10    | 5   |

$$\begin{array}{r} 25 \overline{) 60} \\ \underline{-50} \\ 10 \end{array} \quad \begin{array}{l} 2 \leftarrow Q \\ 10 \leftarrow r \end{array}$$
$$\begin{array}{r} 10 \overline{) 25} \\ \underline{-20} \\ 5 \end{array} \quad \begin{array}{l} 2 \leftarrow Q \\ 5 \leftarrow R \end{array}$$



## EUCLEDIAN ALGORITHM

1)  $\gcd(25, 60)$

| $q_i$ | $r_1$ | $r_2$ | $r$ |
|-------|-------|-------|-----|
| 2     | 60    | 25    | 10  |
| 2     | 25    | 10    | 5   |
| 2     | 10    | 5     | 0   |
| X     | 5     | 0     | X   |

$\gcd = r_1$

$0 \sqrt{5}$

$$\begin{array}{r} 2 \leftarrow Q \\ 25 \overline{) 60} \\ \underline{-50} \\ 10 \leftarrow r \end{array}$$

$$\begin{array}{r} 2 \leftarrow Q \\ 10 \overline{) 25} \\ \underline{-20} \\ 5 \leftarrow R \end{array}$$

$$\left( \frac{5}{0} \right) ?$$



M2:  $\gcd(25, 60)$

|   |    |    |
|---|----|----|
| 5 | 25 | 60 |
| X | 5  | 12 |

greatest Common Divisor  
 $= 5 = \gcd(25, 60)$

