

Tarea 8

1. Algoritmo de la División

- $a = 59, n = 7$

$$q = 8 \leq 59/7 \leq 9$$

$$\begin{aligned} r &= a - (q)n \\ &= 59 - (8)7 \\ &= 59 - 56 \\ &= 3 \end{aligned} \quad 59 = (8)7 + 3$$

- $a = 34, n = 12$

$$7 \leq 34/12 \leq 8$$

$$\begin{aligned} r &= 34 - (7)12 \\ &= 34 - 84 \\ &= 0 \end{aligned} \quad 34 = (7)12$$

- $a = 100, n = 9$

$$11 \leq 100/9 \leq 12$$

$$\begin{aligned} r &= 100 - (11)9 \\ &= 100 - 99 \\ &= 1 \end{aligned} \quad 100 = (11)9 + 1$$

- $a = -96, n = 12$

$$-8 \leq -96/12 \leq -7$$

$$\begin{aligned} r &= -96 - (-8)12 \\ &= -96 + 96 \\ &= 0 \end{aligned} \quad -96 = (-8)12$$

- $a = -4, n = 5$

$$-1 \leq -4/5 \leq 0$$

$$\begin{aligned} r &= -4 - (-1)5 \\ &= -4 + 5 \\ &= 1 \end{aligned} \quad -4 = (-1)5 + 1$$

Euler's

2. Algorithmo Euclider

• 204, 78

$$\begin{aligned} \downarrow 204 &= (2)78 + 53 \\ \downarrow 78 &= (1)53 + 15 \\ \downarrow 53 &= (3)15 + 8 \\ \downarrow 15 &= (1)8 + 7 \\ \downarrow 8 &= (1)7 + 1 \\ 7 &= (7)\underline{1} + 0 \end{aligned}$$

$$\text{mcd} = 1$$

• 43, 27

$$\begin{aligned} \downarrow 43 &= (3)27 + 12 \\ \downarrow 27 &= (2)12 + 3 \\ 12 &= (4)\underline{3} + 0 \end{aligned}$$

$$\text{mcd} = 3$$

• 138, 61

$$\begin{aligned} \downarrow 138 &= (2)61 + 16 \\ \downarrow 61 &= (3)16 + 13 \\ \downarrow 16 &= (1)13 + 3 \\ \downarrow 13 &= (4)3 + 1 \\ 3 &= (3)\underline{1} + 0 \end{aligned}$$

$$\text{mcd} = 1$$

• 237, 49

$$\begin{aligned} \downarrow 237 &= (4) 49 + 35 \\ \downarrow 49 &= (1) 35 + 14 \\ \downarrow 35 &= (2) 14 + 7 \\ \downarrow 14 &= (2) \underline{7} + 0 \end{aligned}$$

med = 7

3. Coeficientes de Bézout

• -112, -91

$$\begin{array}{l|l} -112 = (2) -41 + 70 & 7 = 49 - (2) 21 \\ -91 = (-2) 70 + 49 & = 49 - (2) [70 - 49] = (3) 49 - (2) 70 \\ 70 = (1) 49 + 21 & = (3) [-91 + (2) 70] - (2) [-112 + (2) 91] \\ 49 = (2) 21 + 7 & = (3) -91 + (4) -41 + (-2)(-112) + (6) 70 \\ 21 = (3) \underline{(7)} + 0 & = (7) -91 + (-2) -112 + 6 [-112 + (2) 91] \\ & = (-5) -91 + (4) -112 \end{array}$$

$7 = (4) -112 + (-5) -91$

• -105, 39 | $\text{med}(105, 39) = \text{med}(-105, 39)$

$$\begin{array}{l|l} 105 = (2) 39 + 27 & 3 = 27 - (2) 12 \\ 39 = (1) 27 + 12 & = 27 - (2) [39 - 27] = (3) 27 - (2) 39 \\ 27 = (2) 12 + 3 & = (3) [105 - (2) 39] - (2) 39 \\ 12 = (4) 3 + 0 & = (-3) -105 + (-6) 39 - (2) 39 \\ & = (-3) -105 + (-8) 39 \end{array}$$

$3 = (-3) -105 + (-8) 39$