Tarea 8

1. Algoritmo de la División

- $a = 59$, $n = 7$

$$q = 8 < \tfrac{59}{7} < 9$$

$r = a - (q)n$

$= 59 - (8)n$ | $59 = (8)7 + 3$

$= 59 - 56$

$= 3$

- $a = 84$, $n = 12$

$$7 \leq \tfrac{84}{12} < 8$$

$r = 84 - (7)12$ | $84 = (7)12$

$= 84 - 84$

$= 0$

- $a = 100$, $n = 9$

$$11 < \tfrac{100}{9} < 12$$

$r = 100 - (11)9$ | $100 = (11)9 + 1$

$= 100 - 99$

$= 1$

- $a = -96$, $n = 12$

$$-8 \leq \tfrac{-96}{12} \leq -7$$

$r = -96 - (-8)12$ | $-96 = (-8)12$

$= -96 + 96$

$= 0$

- $a = -4$, $n = 5$

$$-1 < \tfrac{-4}{5} < 0$$

$r = -4 - (-1)5$ | $-4 = (-1)5 + 1$

$= -4 + 5$

$= 1$

Euclides

2. Algoritmo Euclidea

• 204, 78

$$209 = (2)78 + 53$$
$$78 = (1)53 + 15$$
$$53 = (3)15 + 8$$
$$15 = (1)8 + 7$$
$$8 = (1)7 + 1$$
$$7 = (7)1 + 0$$

mcd = 1

• 43, 27

$$43 = (3)27 + 12$$
$$27 = (2)12 + 3$$
$$12 = (4)3 + 0$$

mcd = 3

• 138, 61

$$138 = (2)61 + 16$$
$$61 = (3)16 + 13$$
$$16 = (1)13 + 3$$
$$13 = (4)3 + 1$$
$$3 = (3)1 + 0$$

mcd = 1

• 237, 49

$237 = (4)\, 49 + 35$ ↓
$49 = (1)\, 35 + 14$ ↓
$35 = (2)\, 14 + 7$ ↓
$14 = (2)\, \underline{7} + 0$ ↓

mcd = 7

3. Coeficientes de Bézout

• −112, −91

$-112 = (2)\, -91 + 70$	$7 = 49 - (2)\, 21$
$-91 = (-2)\, 70 + 49$	$= 49 - (2)[\,70 - 49\,] = (3)\, 49 - (2)\, 70$
$70 = (1)\, 49 + 21$	$= (3)[\,-91 + (2)\, 70\,] - (2)[\,-112 + (2)\, 91\,]$
$49 = (2)\, 21 + 7$	$= (3)\, -91 + (4)\, -91 + (-2)(-112) + (6)\, 70$
$21 = (3)\,\textcircled{7} + 0$	$= (7)\, -91 + (-2)\, -112 + 6[\,-112 + (2)\, 91\,]$
	$= (-5)\, -91 + (4)\, -112$

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

• −105, 39 | mcd(105, 34) = mcd(−105, 34)

$105 = (2)\, 39 + 27$	$3 = 27 - (2)\, 12$
$39 = (1)\, 27 + 12$	$= 27 - (2)[\,39 - 27\,] = (3)\, 27 - (2)\, 34$
$27 = (2)\, 12 + 3$	$= (3)[\,105 - (2)\, 34\,] - (2)\, 34$
$12 = (4)\, 3 + 0$	$= (-3)\, -105 + (-6)\, 34 - (2)\, 34$
	$= (-3)\, -105 + (-8)\, 34$

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