⑤

1- $1101_2 + 1011_2$

$$\begin{array}{r} {\scriptstyle 1\,1\,\,1\,\,\,\,} \\ 1101 \\ +\,1011 \\ \hline 11000 \end{array} \qquad 11000_2$$

11000

- $0 \cdot 2^0 = 0$
- $0 \cdot 2^1 = 0$
- $0 \cdot 2^2 = 0$
- $1 \cdot 2^3 = 8$
- $1 \cdot 2^4 = 16$

24

Validación

1011

- $1 \cdot 2^0 = 1$
- $1 \cdot 2^1 = 2$
- $0 \cdot 2^2 = 0$
- $1 \cdot 2^3 = 8$

11

1101

- $1 \cdot 2^0 = 1$
- $0 \cdot 2^1 = 0$
- $1 \cdot 2^2 = 4$
- $1 \cdot 2^3 = 8$

13

$11 + 13 = 24$

$1101_2 + 1011_2 = 11000_2$

2- $11010_2 + 10101_2$

$$\begin{array}{r} 11010 \\ +\ 10101 \\ \hline 101111 \end{array}$$

101111

$1 \cdot 2^0 = 1$

$1 \cdot 2^1 = 2$

$1 \cdot 2^2 = 4$

$1 \cdot 2^3 = 8$

$0 \cdot 2^4 = 0$

$1 \cdot 2^5 = 32$

47

11010

$0 \cdot 2^0 = 0$

$1 \cdot 2^1 = 2$

$0 \cdot 2^2 = 0$

$1 \cdot 2^3 = 8$

$1 \cdot 2^4 = 16$

26

10101

$1 \cdot 2^0 = 1$

$0 \cdot 2^1 = 0$

$1 \cdot 2^2 = 4$

$0 \cdot 2^3 = 0$

$1 \cdot 2^4 = 16$

21

$26 + 21 = 47$

$11010_2 + 10101_2 = 101111_2$

$3 - 57_8 + 24_8$

57_8
- $7 \cdot 8^0 = 7$
- $5 \cdot 8^1 = 40$

47_{10}

24_8
- $4 \cdot 8^0 = 4$
- $2 \cdot 8^1 = 16$

20_{10}

$47_{10} + 20_{10} = 67_{10}$

67	8		
64	8	8	103_8
3	8	(1)	
	0		

$57_8 + 24_8 = 103_8 = 67_{10}$

4- $145_8 + 73_8$

145_8

$\hookrightarrow 5 \cdot 8^0 = 5$

$\hookrightarrow 4 \cdot 8^1 = 32$

$\hookrightarrow 1 \cdot 8^2 = 64$

101_{10}

73_8

$\hookrightarrow 3 \cdot 8^0 = 3$

$\hookrightarrow 7 \cdot 8^1 = 56$

59_{10}

$101_{10} + 59_{10} = 160_{10}$

$160_{10} \mid 8$

$160 \quad 20 \mid 8$

$0 \quad 16 \quad 2$

4

240_8

$145_8 + 73_8 = 240_8$

$240_8 = 160_{10}$

5- $A3_{16} + 5F_{16}$

$A3_{16}$
- $3 \cdot 16^0 = 3$
- $10 \cdot 16^1 = 160$

163_{10}

$5F_{16}$
- $15 \cdot 16^0 = 15$
- $5 \cdot 16^1 = 80$

95_{10}

$163_{10} + 95_{10} = 258_{10}$

$258_{10} \mid 16$

$256 \quad 16 \mid 16$

$2 \quad 1 \quad 6 \quad 0$

102_{16}

$A3_{16} + 5F_{16} = 102_{16}$

$102_{16} = 258_{10}$

6- $2D_{16} + 19_{16}$

$2D_{16}$
- $13 \cdot 16^0 = 13$
- $2 \cdot 16^1 = 32$

45_{10}

19_{16}
- $9 \cdot 16^0 = 9$
- $1 \cdot 16^1 = 16$

25_{10}

$45_{10} + 25_{10} = 70_{10}$

70_{10} / 16

64 | 4

6

46_{16}

$2D_{16} + 19_{16} = 46_{16}$

$46_{16} = 70_{10}$

7- $101011_2 + 11010_2$

101011

$1 \cdot 2^0 = 1$

$1 \cdot 2^1 = 2$

$0 \cdot 2^2 = 0$

$1 \cdot 2^3 = 8$

$0 \cdot 2^4 = 0$

$1 \cdot 2^5 = 32$

43_{10}

11010

$0 \cdot 2^0 = 0$

$1 \cdot 2^1 = 2$

$0 \cdot 2^2 = 0$

$1 \cdot 2^3 = 8$

$1 \cdot 2^4 = 16$

26_{10}

$43_{10} + 26_{10} = 69_{10}$

69	2					
68	34	2				
1	34	17	2			
	0	16	8	2		
		1	8	4	2	
			0	4	2	2
				0	2	1
					0	

1000101_2

$101011_2 + 11010_2 = 1000101_2$

$1000101_2 = 69_{10}$

8- $77_8 + 56_8$

77_8
- $7 \cdot 8^0 = 7$
- $7 \cdot 8^1 = 56$

63_{10}

56_8
- $6 \cdot 8^0 = 6$
- $5 \cdot 8^1 = 40$

46_{10}

$63_{10} + 46_{10} = 109_{10}$

109_{10} | 8
104 | 13 | 8
5 | 8 | 1
5

155_8

$77_8 + 56_8 = 155_8$

$155_8 = 109_{10}$

9- $1F_{16} + E_{16}$

$1F_{16}$
↳ $15 \cdot 16^0 = 15$
↳ $1 \cdot 16^1 = 16$
31

E_{16}
↳ $14 \cdot 16^0 = 14$

$31_{10} + 14_{10} = 45_{10}$

45_{10} / 16
32 (2)
13

$2D_{16}$

$1F_{16} + E_{16} = 2D_{16}$

$2D_{16} = 45_{10}$

1 1

10.- $1101_2 + 101_2$

1101_2

$1 \cdot 2^0 = 1$

$0 \cdot 2^1 = 0$

$1 \cdot 2^2 = 4$

$1 \cdot 2^3 = 8$

13_{10}

101_2

$1 \cdot 2^0 = 1$

$0 \cdot 2^1 = 0$

$1 \cdot 2^2 = 4$

5_{10}

$13_{10} + 5_{10} = 18_{10}$

18	2			
18	9	2		
0	8	4	2	
	1	4	2	2
		0	2	1
			0	

10010_2

$1101_2 + 101_2 = 10010_2$

$10010_2 = 18_{10}$

(6)

$1 - 1011_2 + 27_8$

1011_2

$\rightarrow 1 \cdot 2^0 = 1$

$\rightarrow 1 \cdot 2^1 = 2$

$\rightarrow 0 \cdot 2^2 = 0$

$\rightarrow 1 \cdot 2^3 = 8$

11_{10}

27_8

$\rightarrow 7 \cdot 8^0 = 7$

$\rightarrow 2 \cdot 8^1 = 16$

23_{10}

$11_{10} + 23_{10} = 34_{10}$

34_{10}

34	17	8	4	2
0	16	8	4	2
	1	0	0	1

100010_2

34_{10}

32	4
2	

42_8

$34_{10} = 100010_2 = 42_8$

1 1

2- $3F_{16} + 1010_2$

$3F_{16}$

$\rightarrow 15 \cdot 16^0 = 15$

$\rightarrow 3 \cdot 16^1 = 48$

63_{10}

1010_2

$\rightarrow 0 \cdot 2^0 = 0$

$\rightarrow 1 \cdot 2^1 = 2$

$\rightarrow 0 \cdot 2^2 = 0$

$\rightarrow 1 \cdot 2^3 = 8$

10_{10}

$63_{10} + 10_{10} = 73_{10}$

$73_{10} \mid 16$

$64 \quad 4$

09

49_{16}

$73_{10} \mid 2$

$72 \quad 36 \mid 2$

$1 \quad 36 \quad 18 \mid 2$

$0 \quad 18 \quad 9 \mid 2$

$0 \quad 8 \quad 4 \mid 2$

$1 \quad 4 \quad 2 \mid 2$

$0 \quad 2 \quad 1 \mid 2$

$0 \quad 0$

1001001_2

$73_{10} = 49_{16} = 1001001_2$

3- $72_8 + 1D_{16}$

72_8
- $2 \cdot 8^0 = 2$
- $7 \cdot 8^1 = 56$

58_{10}

$1D_{16}$
- $13 \cdot 16^0 = 13$
- $1 \cdot 16^1 = 16$

29_{10}

$58_{10} + 29_{10} = 87_{10}$

87_{10} | 8
80 | 10 | 8
7 | 8 | 1
2

127_8

87_{10} | 2
86 | 43 | 2
1 | 42 | 21 | 2
20 | 10 | 5 | 2
1 | 10 | 4 | 2 | 1
0 | 2 | 1
0

1010111

87_{10} | 16
80 | 5
7

57_{16}

$87_{10} = 127_8 = 57_{16}$

1 1

4- $10011_2 + 30_{16}$

10011_2

$1 \cdot 2^0 = 1$
$1 \cdot 2^1 = 2$
$0 \cdot 2^2 = 0$
$0 \cdot 2^3 = 0$
$1 \cdot 2^4 = 16$

19_{10}

30_{16}

$0 \cdot 16^0 = 0$
$3 \cdot 16^1 = 48$

48_{10}

$19_{10} + 48_{10} = 67_{10}$

67_{10} | 2
66 | 33 | 2
1 | 32 | 16 | 2
1 | 16 | 8 | 2
0 | 8 | 4 | 2
0 | 4 | 2 | 2
0 | 2 | 1
0

1000011_2

67_{10} | 16
64 | 4
3

43_{16}

$67_{10} = 1000011_2 = 43_{16}$

5- $5A_{16} + 54_8$

$5A_{16}$
- $10 \cdot 16^0 = 10$
- $5 \cdot 16^1 = 80$

90_{10}

54_8
- $4 \cdot 8^0 = 4$
- $5 \cdot 8^1 = 40_{10}$

$90_{10} + 40_{10} = 130_{10}$

$130_{10} \mid 16$
$128 \quad (8)$
2

82_{16}

$130_{10} \mid 8$
$128 \quad 16 \mid 8$
$2 \quad 16 \quad (2)$
0

202_8

$130_{10} = 82_{16} = 202_8$

/ /

6- $1101_2 + 12_{16}$

1101_2

$\hookrightarrow 1 \cdot 2^0 = 1$

$\hookrightarrow 0 \cdot 2^1 = 0$

$\hookrightarrow 1 \cdot 2^2 = 4$

$\hookrightarrow 1 \cdot 2^3 = 8$

13_{10}

12_{16}

$\hookrightarrow 2 \cdot 16^0 = 2$

$\hookrightarrow 1 \cdot 16^1 = 16$

18_{10}

$13_{10} + 18_{10} = 31_{10}$

31_{10} /2

30 15 /2

1 14 7 /2

1 6 3 /2

1 2 1

(1)

11111_2

31_{10} /16

16 (1)

15

$1F_{16}$

$31_{10} = 11111_2 = 1F_{16}$

1 1

7- $47_8 + 1001_2$

47

↳ $7 \cdot 8^0 = 7$

↳ $4 \cdot 8^1 = 32$

39_{10}

1001_2

↳ $1 \cdot 2^0 = 1$

↳ $0 \cdot 2^1 = 0$

↳ $0 \cdot 2^2 = 0$

↳ $1 \cdot 2^3 = 8$

9_{10}

$39_{10} + 9_{10} = 48_{10}$

48 | 8 → 6

48 | 8 → 6

0

60_8

48 | 2

48 24 | 2

0 24 12 | 2

12 6 | 2

0 6 3 | 2

0 2 | 1

1

110000_2

$48_{10} = 60_8 = 110000_2$

11

8- $A5_{16} + 1010_2$

$A5_{16}$
- $5 \cdot 16^0 = 5$
- $10 \cdot 16^1 = 160$

165_{10}

1010_2
- $0 \cdot 2^0 = 0$
- $1 \cdot 2^1 = 2$
- $0 \cdot 2^2 = 0$
- $1 \cdot 2^3 = 8$

10_{10}

$165_{10} + 10_{10} = 175_{10}$

175_{10} | 16
160 | 10
15

AF_{16}

175_{10} | 2
174 | 87 | 2
1 | 86 | 43 | 2
1 | 42 | 21 | 2
1 | 20 | 10 | 2
1 | 10 | 5 | 2
0 | 4 | 2 | 2
1 | 2 | 1
0

10101111_2

$175_{10} = AF_{16} = 10101111_2$

9- $37_8 + 1F_{16}$

37_8
- $7 \cdot 8^0 = 7$
- $3 \cdot 8^1 = 24$

31_{10}

$1F_{16}$
- $15 \cdot 16^0 = 15$
- $1 \cdot 16^1 = 16$

31_{10}

$31_{10} + 31_{10} = 62_{10}$

62_{10} | 8
56 | 7
6

76_8

62_{10} | 16
48 | 3
14

$3D_{16}$

$62_{10} = 76_8 = 3D_{16}$

1 1

10- $10101_2 + 42_8$

10101_2

$1 \cdot 2^0 = 1$
$0 \cdot 2^1 = 0$
$1 \cdot 2^2 = 4$
$0 \cdot 2^3 = 0$
$1 \cdot 2^4 = 16$
21_{10}

42_8

$2 \cdot 8^0 = 2$
$4 \cdot 8^1 = 32$
34_{10}

$21_{10} + 34_{10} = 45_{10}$

45_{10} | 2
44 | 22 | 2
1 | 22 | 11 | 2
0 | 10 | 5 | 2
1 | 4 | 2 | 2
1 | 2 | 1
0

101101_2

45_{10} | 8
40 | 5
5

55_8

$45_{10} = 101101_2 = 55_8$