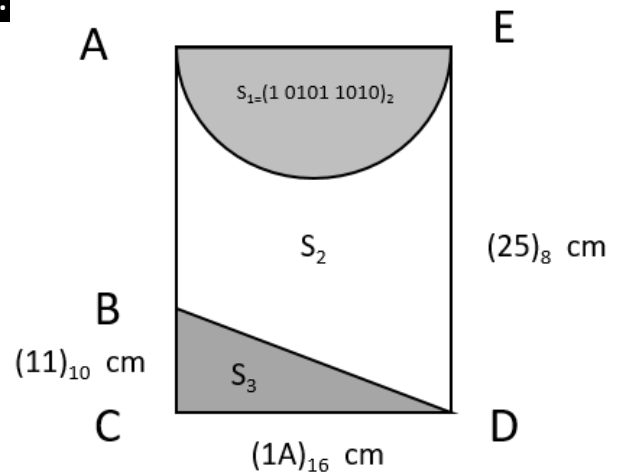


The use of calculators is strictly forbidden.

First name:
Last name:
Group:
Matriculation Number:



Exercise 1 : [Show the calculation steps for all answers.]

1- Let the following geometric shape :

a. Represent BC, CD and S1 in 2's complement (C2) on 12 bits

BC = 0000 0000 1011

CD = 0000 0001 1010

S1 = 0001 0101 1010

b. Represent BC in hexadecimal (base16) and CD in Octal (B8)

BC = (00B)16

CD = 000 000 011 010 = (0032)8

2- Compute the surface S3 using **only hexadecimal** representation.

S3 = 00B * 01A / 2 = (8F)16

6
1A
B
11E

11E	2
1E	8F
1E	
0	

3- Compute the surface ACDE, using **only octal** representation.

ACDE = (0025)8 * (0032)8 = (1042)8

25
32
52
77.
1042

4- Compute the surface S2 using **only 2's complement** representation, Indicate the carry and the overflow.

S2 = ACDE - (S1 + S3) = 0010 0010 0010 + c2(0001 0101 1010) + c2(0000 1000 1111)

S2 = (0000 0011 1001)c2

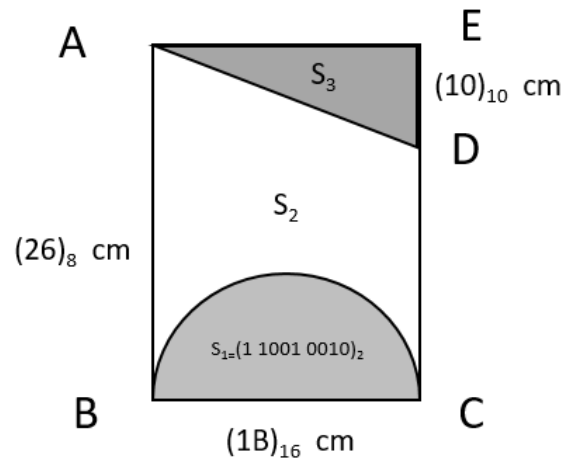
Carry = yes

Overflow = non

0010 0010 0010
1110 1010 0110
10000 1100 1000
1111 0111 0001
10000 0011 1001

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Exercise 1 : [Show the calculation steps for all answers.]

1- Let the following geometric shape :

a. Represent BC, CD and S1 in 2's complement (C2) on 12 bits

DE = 0000 0000 1010

BC = 0000 0001 1011

S1 = 0001 1001 0010

b. Represent BC in hexadecimal (base16) and CD in Octal (B8)

DE = (00A)₁₆

BC = 000 000 011 011 = (0033)₈

2- Compute the surface S3 using **only hexadecimal** representation.

S3 = 00A * 01B / 2 = (87)₁₆

6
1B
A
10E

10E 2
0E 87
0E
0

3- Compute the surface ABCE, using **only octal** representation.

ACDE = (0026)₈ * (0033)₈ = (1122)₈

26
33
102
102 .
1122

4- Compute the surface S2 using **only 2's complement** representation, Indicate the carry and the overflow.

S2 = ABCE - (S1 + S3) = 0010 0101 0010 + c2(0001 1001 0010) + c2(0000 1000 0111)

S2 = (0000 0011 1001)_{c2}

Carry = yes

Overflow = non

0010 0101 0010
1110 0110 1110
10000 1100 0000
1111 0111 1001
10000 0011 1001