

CORRECTION

~ Contrôle rapide ~

Additions et soustractions en binaire

Nom :	Prénom :	Classe :
Remarque :	Note :	

Vous pouvez répondre au verso. Les calculs et les résultats seront évalués.

Pour chaque calculs ci-dessous, réalisez les conversions des opérandes et du résultat et faites les calculs en binaire et en décimal :

1 Additions

A) $(12)_{10} + (8)_{10}$

$$\begin{array}{r}
 \overset{1}{1}100 \\
 + 1000 \\
 \hline
 10100
 \end{array}
 +
 \begin{array}{r}
 \overset{1}{1}2 \\
 + 8 \\
 \hline
 20
 \end{array}
 \begin{array}{l}
 (12)_{10} = 8 + 4 = 2^3 + 2^2 = (1100)_2 \\
 (8)_{10} = 2^3 = (1000)_2 \\
 (20)_{10} = 16 + 4 = 2^4 + 2^2 = (10100)_2
 \end{array}$$

B) $(15)_{10} + (11)_{10}$

$$\begin{array}{r}
 \overset{1}{1}\overset{1}{1}\overset{1}{1}1 \\
 + 1111 \\
 \hline
 11010
 \end{array}
 +
 \begin{array}{r}
 15 \\
 + 11 \\
 \hline
 26
 \end{array}
 \begin{array}{l}
 (15)_{10} = 8 + 4 + 2 + 1 = 2^3 + 2^2 + 2^1 + 2^0 = (1111)_2 \\
 (11)_{10} = 8 + 2 + 1 = 2^3 + 2^1 + 2^0 = (1011)_2 \\
 (26)_{10} = 16 + 8 + 2 = 2^4 + 2^3 + 2^1 = (11010)_2
 \end{array}$$

C) $(101)_2 + (101)_2$

$$\begin{array}{r}
 \overset{1}{1} \overset{1}{1} \\
 + 101 \\
 \hline
 1010
 \end{array}
 +
 \begin{array}{r}
 \overset{1}{5} \\
 + 5 \\
 \hline
 10
 \end{array}
 \begin{array}{l}
 (101)_2 = 2^2 + 2^0 = 4 + 1 = (5)_{10} \\
 (1010)_2 = 2^3 + 2^1 = 8 + 2 = (10)_{10}
 \end{array}$$

2 Soustractions

TODO

$$\begin{array}{r} \text{A) } (15)_{10} - (11)_{10} \\ \begin{array}{r} - 1111 \\ - 1011 \\ \hline 100 \end{array} \quad \begin{array}{r} - 15 \\ - 11 \\ \hline 4 \end{array} \end{array} \quad (4)_{10} = 2^2 = (100)_2$$

$$\begin{array}{r} \text{B) } (12)_{10} - (10)_{10} \\ \begin{array}{r} - 1100 \\ - 1010 \\ \hline 10 \end{array} \quad \begin{array}{r} - 12 \\ - 10 \\ \hline 2 \end{array} \end{array} \quad \begin{array}{l} (12)_{10} = 8 + 4 = 2^3 + 2^2 = (1100)_2 \\ (10)_{10} = 8 + 2 = 2^3 + 2^1 = (1010)_2 \\ (2)_{10} = 2^1 = (10)_2 \end{array}$$

$$\begin{array}{r} \text{C) } (5)_2 - (2)_2 \\ \begin{array}{r} - 101 \\ - 10 \\ \hline 11 \end{array} \quad \begin{array}{r} - 5 \\ - 2 \\ \hline 3 \end{array} \end{array} \quad (3)_{10} = 2 + 1 = 2^1 + 2^0 = (11)_2$$

$$\begin{array}{r} \text{D) [Bonus] } (22)_{10} + (7)_{10} \\ \begin{array}{r} + 10110 \\ + 111 \\ \hline 11101 \end{array} \quad \begin{array}{r} + 22 \\ + 7 \\ \hline 29 \end{array} \end{array} \quad \begin{array}{l} (22)_{10} = 16 + 4 + 2 = 2^4 + 2^2 + 2^1 = (10110)_2 \\ (7)_{10} = 4 + 2 + 1 = 2^2 + 2^1 + 2^0 = (111)_2 \\ (29)_{10} = 16 + 8 + 4 + 1 = 2^4 + 2^3 + 2^2 + 2^0 = (11101)_2 \end{array}$$