1. $4_{(10)} | 2$

$\dfrac{4}{0} \quad \dfrac{2}{2} | 2$

$\quad \dfrac{2}{0} \dfrac{4}{0} | 2$

$\quad \dfrac{0|0}{1}$

$\Rightarrow 4_{(10)} = \overbrace{0100}^{4}{}_{(2)} = 4_{(16)}$

$10_{(10)} | 2$

$\dfrac{10}{0} \quad \dfrac{5}{4} | 2$

$\quad \dfrac{}{1} \dfrac{2}{0} | 2$

$\quad \dfrac{}{} \dfrac{0|0}{1} | 2$

$\quad \dfrac{0|0}{1}$

$\Rightarrow 10_{(10)} = \overbrace{1010}^{A}{}_{(2)} = A_{(16)}$

$15_{(10)} | 2$

$\dfrac{15}{1} \quad \dfrac{7}{6} | 2$

$\quad \dfrac{}{1} \dfrac{3}{2} | 2$

$\quad \dfrac{}{1} \dfrac{0|0}{1} | 2$

$\Rightarrow 15_{(10)} = \overbrace{1111}^{F}{}_{(2)} = F_{(16)}$

$32_{(10)} | 2$

$\dfrac{32}{0} \quad \dfrac{16}{16} | 2$

$\quad \dfrac{}{0} \dfrac{8}{8} | 2$

$\quad \dfrac{}{0} \dfrac{4}{4} | 2$

$\quad \dfrac{}{0} \dfrac{2}{2} | 2$

$\quad \dfrac{0}{1} \dfrac{0|0}{1}$

$\Rightarrow 32_{(10)} = \overbrace{00100000}^{2 \quad 0}{}_{(2)} = 20_{(16)}$

2. $3_{(10)} = 3_{(16)} = 0011_{(2)}$

$11_{(10)} = B_{(16)} = 1011_{(2)}$

$16_{(10)} \quad | \underline{16}$
$\underline{16} \quad | 1 | \underline{16}$
$0 \quad \underline{0} | \underline{0}$
$\qquad 1$

$\Rightarrow 11_{(10)} = B \; 10_{(16)} = 00010000_{(2)}$

$17_{(10)} \quad | \underline{16}$
$\underline{16} \quad | 1 | \underline{16}$
$1 \quad \underline{0} | \underline{0}$

$\Rightarrow 17_{(10)} = 11_{(16)} = 00010001_{(2)}$

3. $1010_{(2)} = A_{(16)}$

$0111_{(2)} = 7_{(16)}$

$1111_{(2)} = F_{(16)}$

$\underbrace{1000}_{8}\underbrace{1010}_{A} = 8A_{(16)}$

$\underbrace{1101}_{7}\underbrace{0111}_{1}\underbrace{1101}_{A}\underbrace{0111}_{F} = 1AF$

4. $3_{(16)} = 0011_{(2)}$

$A_{(16)} = 1010_{(2)}$

$F_{(16)} = 1111_{(2)}$

$2B_{(16)} = 00101011_{(2)}$

$2F8_{(16)} = 001011111000_{(2)}$

5. $1_{(2)} + 1_{(2)} = 10_{(2)}$

$10 + 10 = 100_{(2)}$

$111 + 1 = 1000$

$1010 - 1 = 1001$

$1000 - 10 = 100 \; 110$

6. $9_{(16)} + 1_{(16)} = A_{(16)}$

$B + 2 = D_{(16)}$

$F + 1 = 10$

$10 + A = 1A$

$10 - 2 = E$

$B - 3 = 8$

7. $9A7D_{(16)} = 1001\ 1010\ 0111\ 1101_{(2)}$

complement: $0110\ 0101\ 1000\ 0011 = 6583_{(16)} \neq 7583_{(16)}$

$\underbrace{6}\ \underbrace{5}\ \underbrace{8}\ \underbrace{3}$

$\Rightarrow$ Not complementary

$$\begin{array}{r} 1\ddot{0}\ddot{0}00 \\ 9A7D \\ \hline 6583_{(16)} \end{array} (-) \neq 7583_{(16)}$$

$000F095D_{(16)} = 0000\ 0000\ 0000\ 1111\ 0000\ 1001\ 0101\ 1101$

$C: \underbrace{1111}_{F}\ \underbrace{1111}_{F}\ \underbrace{1111}_{F}\ \underbrace{0000}_{0}\ \underbrace{1111}_{F}\ \underbrace{0110}_{6}\ \underbrace{1010}_{A}\ \underbrace{0011}_{3} = FFF0F6A3_{(16)}$

$$\begin{array}{r} 1\ddot{0}\ddot{0}0\ddot{0}0\ddot{0}00 \\ 000F095D \\ \hline FFF0F6A3_{(16)} \end{array} (-)$$

$\Rightarrow$ Complementary

$4BA1_{(16)} = 0100\ 1011\ 1010\ 0001$

$C: \underbrace{1011\ 0100\ 0101\ 1111}_{B\ \ 4\ \ 5\ \ F} = B45F_{(16)} \neq 5C93_{(16)}$

$$\begin{array}{r} 1\ddot{0}\ddot{0}00 \\ 4BA1 \\ \hline B45F \end{array} (-)$$

$\Rightarrow$ Not complementary

$7F_{(16)} = 0111\ 1111_{(16)(2)}$

$C: \underbrace{1000\ 0001}_{8\ \ \ 1} = 81_{(16)}$

$$\begin{array}{r} 1\ddot{0}0 \\ 7F \\ \hline 81_{(16)} \end{array}$$

$\Rightarrow$ Complementary

$732A_{(16)} = 0111\ 0011\ 0010\ 1010$

$C: \underbrace{1000\ 1100\ 1101\ 0110}_{8\ \ \ C\ \ \ D\ \ \ 6} = 8CD6_{(16)}$

```
  10000
  732A
―――――
  8C06
```

$\Rightarrow$ Not complementary

8. $8_{(10)} = 1000\ 0000\ 1000_{(2)}$

```
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|2
                0 1|0
                  1
```

$67_{(10)} = 0100\ 0011_{(2)}$

```
230(10) |16
224     ―――――
―――――    14|16
   6     0|0
         E
```

$\Rightarrow 230_{(10)} = E6_{(16)} = 1110\ 0110$

9. $-6_{(10)} = ?$

$6_{(10)} = 0000\ 0000\ 0000\ 0110$

$-6_{(10)} = 1111\ 1111\ 1111\ 1010$

$-121_{(10)} = ?$

```
121|2
120|60|2
  1 60|30|2
     0 30|15|2
        0 15|7|2
           1 6|3|2
             1 2|1|2
               1 0|0
                 1
```

$121_{(10)} = 1111\ 001_{(2)}$

$0000\ 0000\ 0111\ 1001$

$-121_{(10)} = 1111\ 1111\ 1000\ 0111_{(2)}$

```
70(10) |2
70     ―――
―――    35|2
 0     34|17|2
       1 16|8|2
         1 8|4|2
           0 4|2|2
             0 2|1|2
               0 1|0
                 1
```

$= 1000\ 110_{(2)}$

$= 0000\ 0000\ 0100\ 0110$