

Homework #1 Answers

1. Convert the decimal number 657_{10} to the following bases:

- a. $\underline{\quad 291 \quad}_{16}$ $657/16 \rightarrow 41$ $657\%16 \rightarrow 1$
 $41/16 \rightarrow 2$ $41\%16 \rightarrow 9$
- b. $\underline{\quad 3B7 \quad}_{13}$ $657/13 \rightarrow 50$ $657\%13 \rightarrow 7$
 $50/13 \rightarrow 3$ $50\%13 \rightarrow B$
- c. $\underline{\quad 1221 \quad}_8$ $291_{16} \rightarrow 0010\ 1001\ 0001_2 \rightarrow 001\ 010\ 010$
 $001_2 \rightarrow 1221_8$
- d. $\underline{\quad 548 \quad}_{11}$ $657/11 \rightarrow 59$ $657\%11 \rightarrow 8$
 $59/11 \rightarrow 5$ $59\%11 \rightarrow 4$

2. Perform the following conversions:

- a. 656_7 to $\underline{\quad 335 \quad}_{10}$ to $\underline{\quad 2320 \quad}_5$ $656_7 \rightarrow 6 \cdot 7^2 + 5 \cdot 7^1 + 6 \cdot 7^0 \rightarrow 294 + 35 + 6 \rightarrow 335_{10}$
- $335/5 \rightarrow 67$ $335\%5 \rightarrow 0$
 $67/5 \rightarrow 13$ $67\%5 \rightarrow 2$
 $13/5 \rightarrow 2$ $13\%5 \rightarrow 3$
- to $\underline{\quad 412 \quad}_9$ $335/9 \rightarrow 37$ $335\%9 \rightarrow 2$
 $37/9 \rightarrow 4$ $37\%9 \rightarrow 1$

3. Convert the hexadecimal number $7B9F_{16}$ to the following bases:

- a. $\underline{\quad 75637 \quad}_8$ $7B9F_{16} \rightarrow 0111\ 1011\ 1001\ 1111_2 \rightarrow 0\ 111\ 101\ 110$
 $011\ 111_2 \rightarrow 75637_8$
- b. $\underline{\quad 11535 \quad}_{13}$ $31647/13 \rightarrow 2434$ $31647\%13 \rightarrow 5$
 $2434/13 \rightarrow 187$ $2434\%13 \rightarrow 3$
 $187/13 \rightarrow 14$ $187\%13 \rightarrow 5$
 $14/13 \rightarrow 1$ $14\%13 \rightarrow 1$
- c. $\underline{\quad 21860 \quad}_{11}$ $31647/11 \rightarrow 2877$ $31647\%11 \rightarrow 0$
 $2877/11 \rightarrow 261$ $2877\%11 \rightarrow 6$
 $261/11 \rightarrow 23$ $261\%11 \rightarrow 8$
 $23/11 \rightarrow 2$ $23\%11 \rightarrow 1$

d. $\underline{31647}_{10} = 7B9F_{16} \Rightarrow 7 \cdot 16^3 + B \cdot 16^2 + 9 \cdot 16^1 + F \cdot 16^0 \Rightarrow 28672 + 2816 + 144 + 15 \Rightarrow 31647$

4. Perform the following computations:

a. $56_7 + 34_7 = \underline{123}_7$

a. $56_{11} + 34_{11} = \underline{8A}_{11}$

a. $43_5 + 34_5 = \underline{132}_5$

a. $86_9 + 37_9 = \underline{134}_9$