

Elementary Division Solutions

1. Computer Number Systems

$$\begin{aligned} A6C2E_{16} &= 1010\ 0110\ 1100\ 0010\ 1110_2 \text{ when using 4 bits per digit} \\ &= 10\ 100\ 110\ 110\ 000\ 101\ 110_2 \text{ when using 3 bits per digit} \\ &= 2466056_8 \end{aligned}$$

1. 2466056₈**2. Computer Number Systems**

$$\begin{aligned} 375_8 &= 3 \cdot 8^2 + 7 \cdot 8^1 + 5 \cdot 8^0 = 3 \cdot 64 + 7 \cdot 8 + 5 \cdot 1 = 192 + 56 + 5 = 253_{10} \\ 100_{16} &= 1 \cdot 16^2 + 0 \cdot 16^1 + 0 \cdot 16^0 = 1 \cdot 256 + 0 + 0 = 256_{10} \\ 11111110_2 &= 1 \cdot 2 + 1 \cdot 4 + 1 \cdot 8 + 1 \cdot 16 + 1 \cdot 32 + 1 \cdot 64 + 1 \cdot 128 = 254_{10} \\ 255_{10} \end{aligned}$$

2. 100₁₆**3. Computer Number Systems**

$$\begin{array}{ll} 414_8 = 100\ 001\ 100_2 & \text{has 3 1's} \\ 1B5_{16} = 1\ 1011\ 0101_2 & \text{has 6 1's} \\ A68_{16} = 1010\ 0110\ 1000_2 & \text{has 5 1's} \\ 524_8 = 101\ 010\ 100_2 & \text{has 4 1's} \end{array}$$

3. 1B5 or 1B5₁₆**4. Computer Number Systems**

$$\begin{array}{ll} 57_8 = 5 \cdot 8 + 7 = 47 & (47 + 3 \cdot 20 - 57) \cdot 4 \\ 11_2 = 1 + 2 = 3 & (47 + 60 - 57) \cdot 4 \\ 14_{16} = 1 \cdot 16 + 4 = 20 & 50 \cdot 4 \\ 100_2 = 0 + 0 + 4 = 4 & 200 \end{array}$$

4. 200

5. Computer Number Systems

The BLUE component is the last 2 digits in each hexadecimal number. If you subtract 1D from C4 in base 16, you get A7. Borrowing 16 from C makes that B and 4 + 16 - D(13) = 7. Then B(11) - 1 = 10(A).

5. A7₁₆