

1.) Convert the decimal number 53 to binary

|   |    |   |
|---|----|---|
| 2 | 53 |   |
| 2 | 26 | 1 |
| 2 | 13 | 0 |
| 2 | 6  | 1 |
| 2 | 3  | 0 |
|   | 1  | 1 |

$$53 = (110101)_2$$

2.) binary number to decimal

$$\begin{aligned} 110011101 &= 1 \times 2^8 + 1 \times 2^7 + 0 \times 2^6 + 0 \times 2^5 + 1 \times 2^4 + 1 \times 2^3 \\ &\quad + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 \\ &= 256 + 128 + 0 \times 64 + 0 + 16 + 8 + 4 + 0 + 1 \\ &= 256 + 128 + 0 + 0 + 29 \end{aligned}$$

$$(110011101)_2 = 413$$

3.) Average expenditure for first 5 months = 5000  
" " " next 7 months = 5400  
savings = 2300

Income will comprise of total exp and savings.

$$\bar{x} = \overline{AE} = 5000$$

$$\bar{x} = \frac{\sum x}{n} \Rightarrow 5000 = \frac{\sum x}{5} \Rightarrow \sum x = 25,000 \text{ for first 5 months}$$