SS1 Mathematics - Week 1: Number Base System

Lesson Note

SS1 MATHEMATICS - WEEK 1

Theme: Number and Numeration

Topic: Number Base System

Section A: Base Conversion

Example 1: Convert 10102 to base 10

= 1×2^3 + 0×2^2 + 1×2^1 + 0×2^0 = 8 + 0 + 2 + 0 = 1010

Example 2: Convert 2134 to base 10

= 2×16 + 1×4 + 3 = 32 + 4 + 3 = 3910

Example 3: Convert 1101102 to base 10

= 32 + 16 + 0 + 4 + 2 + 0 = 5410

Example 4: Convert 4510 to base 2

-> 1011012

Example 5: Convert 12810 to base 8

-> 2008

Section B: Arithmetic in Base Systems

Example 6: Add 10112 and 11012

  1011

+ 1101

= 110002

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Example 7: Subtract 100102 - 11012

= 1810 - 1310 = 510 -> 1012

Example 8: Multiply 1012 × 112

= 11112

Example 9: Add 7238 + 1568

7238 = 46710, 1568 = 11010 -> 467 + 110 = 57710 -> 11018

Example 10: Add 2910 + 1410 -> 4310 = 1010112

Bonus Examples:

Example 11: Convert 3F16 to base 10

= 3×16 + 15 = 6310

Example 12: Add 1910 and 2710 -> 4610 = 568

Summary:

- Multiply each digit by base powers for base-to-decimal conversion.
- Use repeated division to convert decimal to another base.
- Binary arithmetic: 1+1=10, 1+1+1=11.