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Mathematics

Converting Base 8 to Base 10

Step 1:List the digits in order, as they appear in the number they've given.

Step 2:Then, in another row, count these digits from off the **RIGHT**, starting with <u>zero.</u>

*Reminder: The first row above (labelled "digits") contains the digits from the binary number; the second row (labelled "numbering") contains the power of 8 (the base) corresponding to each digit.

$8^1=8$ Rule:Eight to the power of 1 is **eight.** $8^0=1$ Rule: <u>Any number</u> to the power of 0 is **one.**

Example 1: 158_8 to base $_{10}$

Step 1:

Digits	1	5	9
numbering	2	1	0

 Step 2:$1 \times 8^2 + 5 \times 8^1 + 9x\ 8^0$

Step 3:$1 \times 64 + 5x\ 8 + 9\ x\ 1$

Step 4: $64 + 40 + 9$

Step 5:112

Ans= $158_8 = \underline{112}_{10}$

Example 2: 362_8 to base $_{10}$

Step 1:

Digits	3	6	2
numbering	2	1	0

Step 2: $3x\ 8^2 + 6x\ 8^1 + 2x8^0$

Step 3: $3x64 + 6\ x\ 8 + 2\ x\ 1$

Step 4: $192 + 48 + 2$

Step 5: 242

Ans= $362_8 = \underline{242}_{10}$

Activity 2

Convert these numbers from Base $_8$ to Base $_{10}$. Show **ALL** working.

1)45_8=_____$_{10}$

2)75_8= _____ $_{10}$

3)165_8 =_____$_{10}$

4) 1083_8=_____$_{10}$

5) 2371_8=_____$_{10}$