

# Decimal to Binary - method

Q. Convert the decimal number 73 into binary and write it as an 8 bit binary number

Method to use is shown over the next 5 slides.

**Remember: exam papers are non-calculator!**

# Decimal to Binary - method

1. Write out the binary column headings, starting with 1 on the right and doubling

128    64    32    16    8    4    2    1

# Decimal to Binary - method

2. Find the largest binary column which is smaller than your target number (73). Write a 1 under the column.

128    64    32    16    8    4    2    1

1

# Decimal to Binary - method

3. Work out the difference between the column you put the 1 under and the target number. Find the next largest number needed and put a 1 under it ( $73 - 64 = 9$ )

128	64	32	16	8	4	2	1
	1			1			

# Decimal to Binary - method

4. Continue to do this - find the new difference and put a 1 under it ( $9-8 = 1$ )

128	64	32	16	8	4	2	1
	1			1			1

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5. Now put a 0 under all the other column headings

128	64	32	16	8	4	2	1
0	1	0	0	1	0	0	1

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Checks to make:

- odd numbers have a 1 on the right
- even numbers don't have a 1 on the right
- take the binary and convert it back again to double check

**Always check your answers twice!!!**