

# Largest Binary Numbers

Q. What is the largest binary number that can be represented using 5 bits?

Method to use is shown over the next 3 slides.

# Largest Binary Numbers

1. Write out the largest binary number possible with that number of bits:

1 1 1 1 1

# Largest Binary Numbers

2. Write out the binary column headings:

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

At this stage you could just convert this number - but there's a quicker method...

# Largest Binary Numbers

3. Look at the next column header - and then take one away to get the answer:

128	64	<u>32</u>	16	8	4	2	1
			1	1	1	1	1

$$32 - 1 = 31$$

# Largest Binary Numbers

This works because the **next** binary number is:

100000

This number is the **next** column header ( $1 \times 32 +$  nothing else).

So the biggest number below that is one less.

$$32 - 1 = 31$$