INVESTIGATING THE ZEROth POWER

What does 2^0 mean? How can you find the value of 17^0 or 8^0?
Follow the number patterns below to discover the meaning of the zeroth power.

TASK 1 Follow the powers of 2

The table below shows some powers of 2. Follow this pattern backwards to complete this table.

2^0	2^1	2^2	2^3	2^4	2^5
		4	8	16	32

So what is the value of 2^0? _____

TASK 2 Follow the powers of 3

Use patterning to complete this table by inserting the index or basic numeral.

$3^{\square}$	3^1	$3^{\square}$	3^3	$3^{\square}$	3^5
1		9		81	

According to your investigation, 3^0 must equal _____.

TASK 3 Use the rule for dividing numbers with the same base

When dividing numbers with the same base, you can ***subtract*** the indices to simplify.
Complete the logic below to determine the value of any number to the power of zero.

$y^3 \div y^3 = y^{\square}$ **Here y stands for 'any number'.**

But when you divide a number by itself the answer is always _____. **For example, $7 \div 7$ or $3 \div 3$**

Therefore, what is the answer when you divide y^3 by itself? $y^3 \div y^3 =$ _____

So if $y^3 \div y^3 = y^{\square}$ **and** $y^3 \div y^3 =$ _____ then _____

Try this same logic with $k^5 \div k^5$ or $t^{20} \div t^{20}$ or even $9^7 \div 9^7$.

TASK 4 Write a conclusion

From tasks 1, 2 and 3, what can you conclude?

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