

## Class handout

Number Sets:

<b>Natural</b>	<b>N</b>	Closed under operation + and x (multiplication)
<b>Whole</b>	<b>W</b>	Adds <b>Identity element</b>
<b>Integers</b>	<b>Z</b> ( <i>Zahlen</i> (German for numbers, pronounced ['tsa:lən]))	Adds more numbers, so that Z is closed under operation -
<b>Rational</b>	<b>Q</b> (Quotient)	Adds even more numbers, so that Q is closed under operation $\div$ , <b>excluding 0 (zero)</b>

Operation/ Set	Natural (N)	Whole (W)	Integer (Z)	Rational (Q)
+				
-				
*				
$\div$				

**Identity element e** for operation  $\square$  is that  $e \square a = a$ .

Set **N** is closed on operation + because for any element  $N1$  and  $N2$ ,  $N1 + N2 = N3$ ,  $N3 \in \mathbf{N}$