Solution for challenge: Always, Sometimes or Never? Number

Grid Category	Statement	Solution
Sometimes true	The sum of three numbers is odd	The sum on 3,4,5 is 12. 12 is even. The sum of 1,3,5 is 9. 9 is odd.
Sometimes true	Multiples of 5 end in 5	15 is a multiple of 5 that ends in 5 but 10 is a multiple of 5 that doesn't end in 5.
Always true	If you add a multiple of 10 to a multiple of 5, the answer is a multiple of 5	Multiples of 10 are also multiples of 5, so a multiple of 5 plus a multiple of 5 is a multiple of 5. 10+15=25. 25 is a multiple of 5.

Another example: -20+-15=-35. -35 is a multiple of 5. |
| Always true | If you add 1 to an odd number, you get an even number | 1 is an odd number, and if you add an odd number with an odd number, you will always get an even number. 1+5=6. 6 is an even number.

Another example: 1+527=528. 528 is an even number.

It also works with negatives: 1+-9277=-9276 -9276 is an even number. |
| Never true | If you add two odd numbers, you get an odd number | Two odd numbers will never result in an odd number if the operation is addition. 3+5=8. 8 is even.

Same holds true for negative numbers: -1+-3=-4 |
| Sometimes true | When you multiply two numbers you will always get a bigger number | For numbers over 1, the result will always be bigger, but for negatives and decimals between 0 and 1, the result will always be smaller. 2x3=6. 6 is bigger than 2 and 3. 0.5x2=1. In this, 1 is smaller than 2. |

| Never true | A square number has an even number of factors | Each factor usually has a 'partner' to multiply to form the original number, so there will be an even number of factors. But for square numbers, the square root doesn't have a 'partner' because it multiplies itself to form a square number. So square numbers never have even number of factors.

Example: Factors of 16: 1, 16, 2, 8, 4
There are 5 factors.

Another example:

Factors of 121: 1, 121, 11
There are 3 factors. |
|---|---|---|
| Sometimes true | Dividing a whole number by a half makes it twice as big | This is true for numbers greater than 1, but for negatives, the number becomes smaller. $-3 \div 0.5 = -6$ |
| Sometimes true | If you add a number to 5, your answer will be bigger than 5 | If you add a negative number to 5, you will always get a smaller answer. $5+-2=3$. 3 is smaller than 5.

This also works of positives:

$1+5=6$.
6 is greater than 5. |
| Always true | The sum of three consecutive numbers is divisible by 3 | $1+2+3=6$ 6 is divisible by 3
$-10+-11+-12=-33$ -33 is divisible by 3 |