Lesson 2 – Commutativity and Strategies for Addition/Subtraction

Starter

1) 234 + 129
2) 0.35 + 2.367
3) 673 – 388
4) 34.57 – 1.236
5) 0.129 + 11.2362

Starter Answers

1) 363 2) 2.717 3) 285 4) 33.334 5) 11.3652

Operations are **commutative** if they can be carried out in any order and still get the same answer.
For example, **addition** is commutative since we could do 2 + 3 or 3 + 2 and still get 5 as the answer.

Example 1

Decide whether these operations are commutative or not. Write down an example to demonstrate each one.
1) Multiplication
2) Subtraction
3) Division

Answers

1) Multiplication is **commutative**. For example, we could do 4 x 5 or 5 x 4 and still get 20 as the answer.
We could do this with any number of values. For example, if we had 2 x 3 x 4 this would be the same as 3 x 2 x 4 or 4 x 2 x 3 etc.

2) Subtraction is **not commutative**. For example, $3 - 5 \neq 5 - 3$ ($\neq$ means not equal to)

3) Division is **not commutative**. For example, $10 \div 5 \neq 5 \div 10$

For **additions** and **subtractions**, we are allowed to change the order of the calculation as long as we are performing the correct operations to the correct numbers.

Example 2

Place one of these signs (= or ≠) between these sets of calculations

1) 14 + 5 – 9 14 – 9 + 5

In both calculations, we are doing two operations to 14. We are doing +5 and -9. It does not matter which order we do this in, as long as the 5 is being added and the 9 is being subtracted.

So, we have 14 + 5 – 9 = 14 – 9 + 5

2) 23 – 10 + 3 23 + 10 – 3

We are doing two operations to 23.

We are subtracting 10 in the first one but adding 10 in the second one.

Similarly, we are adding 3 in the first one but subtracting 3 in the second.

So, these calculations are not equal.

23 – 10 + 3 ≠ 23 + 10 – 3

3) 18 – 6 + 2 6 – 18 + 2

18 – 6 is not equal to 6 – 18 since subtraction is not commutative.

We are then adding 2 to both calculations.

So therefore 18 – 6 + 2 ≠ 6 – 18 + 2

Your go

Place one of these signs (= or ≠) between each calculation

1) 16 + 19 + 15 15 + 16 + 19
2) 30 ÷ 2 2 ÷ 30
3) 12 – 5 – 7 12 – 7 – 5
4) 2 x 4 x 5 x 6 4 x 6 x 5 x 2
5) 15 + 8 – 9 15 – 8 + 9
6) 26 – 7 + 12 – 2 26 + 12 – 7 – 2

Answers

1) = 2) ≠ 3) = 4) = 5) ≠ 6) =

We can use these properties to make calculations easier to work out.

Example 3

Change the order to make the calculation easier: 23 + 15 + 7 + 5 + 2

Look for pairs of numbers that add up to a multiple of 10

We know that 23 + 7 = 30 and 15 + 5 = 20 and 30 + 20 is easy to work out.

So, since addition is commutative, we can change the calculation to:

23 + 7 + 15 + 5 + 2

= 30 + 20 + 2

= 52

Example 4

Change the order to make the calculation easier: 133 – 48 + 17 – 102

Look for numbers that would add or subtract to make multiples of 10 or easier numbers.
We know 3 + 7 = 10 so we could change the order to:

13**3** + 1**7** – 48 – 102

= 150 – 48 – 102

Subtracting 48 and then subtracting 102 means we have subtracted 150 in total (48 + 102 = 150).

= 150 – 150

= 0

Example 5

Change the order to make the calculation easier: 42 + 56 – 42

We can change the order as long as we are adding 56 and subtracting 42

= 42 – 42 + 56

= 0 + 56

= 56

Your go

Change the order to make the calculation easier
1) 128 + 17 + 12 + 13
2) 55 + 28 + 2 + 15 + 7
3) 146 – 28 + 14 – 12 - 3
4) 98 + 64 – 98 + 6

Answers

1) 170 2) 107 3) 117 4) 70