

Answers Are

Using each of the numbers from 1 to 10 exactly once and each of the operations + and – at least twice (one will be used three times), make 5 expressions whose answers are 15, 1, 1, 1, 19. An expression, in this case, is defined as two numbers and an operation. A possible script for introducing this task is:

Teacher Today we are going to build some expressions. Each expression is made up of two numbers from this list [teacher points at list of numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10] and one of these operations [teacher points at list of operations + + - -]. And the answer has to be a positive whole number. Can someone please tell me an expression?

Student $8 + 1$.

Teacher Ok. The answer for this is 9 [teacher writes $8 + 1 = 9$]. I forgot to mention that the 8 and the 1 and one of the + is now gone [teacher crossing these out on the board]. Can someone give me another expression?

Student $10 - 1$.

[... and so on]

Teacher Ok. So now we have run out of operations, but we still have two more numbers [teacher points at the 3 and the 2]. So, let's make one more expression and you can use one of the operations + or - a third time.

Student $3 - 2$.

Teacher Ok [teacher writes $3 - 2 = 1$]. We now have five expressions [teacher points at the five expressions] and five answers [teacher points at the five answers]. And these answers came from following two rules. We had to use every number from 1 to 10 exactly once and we had to use addition and subtraction each at least twice. And if we follow these rules, we will get five answers. So, if you know I followed these rules and all we had were these answers [teacher erases the expressions leaving just the answers], could we figure out what the expressions were. And, of course, these are not the answers I care about [teacher erases the answers]. These are the answers I care about [teacher writes 15, 1, 1, 1, 19 on the board].
[Teacher makes random groups]

+ + - - □

15, 1, 1, 1, 19

13, 9, 13, 1, 13

2, 2, 2, 3, 8

3, 3, 3, 3, 19

17, 17, 8, 1, 2

2, 2, 7, 7, 7

13, 1, 9, 1, 17

+ + × × □

19, 20, 3, 14, 21

60, 20, 3, 11, 16

42, 24, 3, 36, 15

24, 2, 18, 15, 16

10, 8, 12, 40, 13

16, 63, 11, 30, 7

56, 15, 27, 3, 10

+ - × ÷ □

56, 54, 1, 2, 3

3, 3, 3, 3, 24

2, 2, 2, 2, 9

17, 2, 21, 3, 2

10, 14, 1, 20, 16

2, 3, 7, 7, 7

1, 2, 3, 4, 5