[46 minute lesson]

Switzerland Public Release Lesson 1 Lesson Graph [8th grade]

11 minutes

Public Class Work: Going Over Homework on "Factorizing"

T: "We have been dealing with the subject "factorizing" for the past two lessons. We have been working on two levels, on the one hand we have tried to find out why factorizing is important when calculating with fractions. Today we will get acquainted to a second area where the factorizing is of great help—quadratic equations. We will first correct the homework." The teacher works through the problems, asking if students have any questions.

a) (3x + 4y) (a - b) + (2x + y) (a - b) =
(a-b) [(3x + 4y) + (2x + y)] =
(a-b) (5x + 5y) = 5 (a-b) (x+y)

The teacher asks for what is common- which bracket can be found in both terms, then asks for the students to factorize, or "think about what this parenthesis multiplies".

b) (9x + 8y) (a+b) - (5x + 4y) (a+b) =
(a+b) [(9x + 8y) - (5x + 4y)] =
(a+b) (4x + 4y) = 4 (a+b) (x+y)

c) (2m - 3n) (10by+7ax) - (2m –3n) (3ax-2by) =
(2m-3n) [(10by+7ax) - (3ax-2by)] =
(2m-3n) (4ax + 12by) = 4 (2m-3n) (ax+3y)

Raphaela asks about the minus. The teacher responds that this refers to a difficulty because it is the whole expression that is subtracted.

d) (3u+4v) (6xy-7ab) + (4xy +3ab) (3u+4v) =
(3u+4v) [10xy-4ab] = 2 (3u+4v) (5xy-2ab)

e) (2a-5b) (7m-3n) - (5m+2n) (2a-5b)
= (2a-5b) (2m-5n)

f) (8y+z) ($2x^2$-1) + ($2x^2$-1) (y-z) =
($2x^2$-1) (9y) = 9y ($2x^2$-1)

18 minutes

Private Class Work: Factoring Quadratic Equations

The teacher distributes a worksheet with four quadratic equations and asks students to first try to figure them out in their notebooks, and tells the students that they are welcome to discuss the matter in pairs. She notes that they have these "wonderful examples".

The teacher circulates as students work, asking questions and commenting on their work.

The teacher reads the problem as 169 and then notes that it is 196 on the worksheet. She notes that the reflection stays the same, but the factorization is x-14 times x + 14.

$x^2 + 10x + 25 = 0$
$(x + 5)^2 = 0$
$x + 5 = 0$
$x = -5$

$x^2 - 196 = 0$
~~(x - 13) (x + 13) = 0~~ (x-14) (x+14)=0
~~x - 13 =0 or x + 13=0~~ x-14=0 or x+14=0
~~x = 13 or x= 13~~ x=14 or x=-14

$x^2 - 22x + 121 = 0$
$(x - 11)^2 = 0$
$x - 11 = 0$
$x = 11$

$6x^2 - 7x - 3 = 0$
$(2x - 3) (3x + 1) = 0$
$2x - 3 = 0$ or $3x + 1 = 0$
$x = 3/2$ or $x = -1/3$

8 minutes

Public Class Work: Going Over One of the Problems

They go over one of the problems together as the teacher writes on the overhead:

$6x^2 - 7x - 3 = 0$

T: The ideas that you came up with for filling in the bracket were:
Shane mentioned: 6x 1x
Another possibility is 3x 2x
T: You have another variant, how do you get the product minus 3 with integers, for now?
SN: Plus 3 times minus 1.
T: I could put +3 and –1 here (6x +3) (x –1), or here (6x -1) (x+3)
And the same thing with: (3x+3) (2x -1) (3x +1) (2x -3)
T: How can I recognize if one of these four solutions is the correct one?
SN: I have to obtain 7x.
The teacher and students go on to test out which of the four cases gives them the minus 7x.

T: Tomorrow we will see how one can proceed to be able to solve something like that systematically.

9 minutes

The teacher says, "this is enough new material for today." She assigns the students four practice problems from their book: 14A, 15B, 17B and 16.

She asks students to check their answers in the "solution booklet".

While students are working, she circulates, reminding several students to improve the presentation of their work, and checking the students' work.