

Lesson #6.3: Factor Pairs

Date: April 19, 2023**Learning Goal:** We are learning to find factor pairs, and to ~~expand more complicated polynomials~~.

Today, we are going to play a game. Before we play this game, we need to first figure out how to make lists of factor pairs. A **factor pair** is two numbers which *multiply* to a given number.

Create the complete list of factor pairs for each number.

a) 24

S B

1, 24

2, 12

3, 8

4, 6

b) 32

S B

1, 32

2, 16

4, 8

c) 45

1, 45

3, 15

5, 9

d) 144

1, 144

2, 72

3, 48

4, 36

6, 24

8, 18

9, 16

12, 12

e) 73

1, 73

Prime

S	B	M	A
2	+6	12	+8
-2	-6	12	-8
-2	+6	-12	+4
2	-6	-12	-4

f) 1890

1, 1890

2, 945

3, 630

5, 378

6, 315

7, 270

9, 210

10, 189

14, 135

15, 126

18, 105

21, 90

27, 70

30, 63

35, 54

42, 45

Now that we see how to create a list of factor pairs, we will now add an element which will have us search for a **specific** factor pair. In the following examples, you will be given a number to multiply to and a number to add to. This means that you will need to find a factor pair which both multiplies to and adds to the given numbers. Without further adieu, let's play "Find the Pair!"

Find the **SINGLE** factor pair that satisfies the given conditions. (Note: M = multiply to, A = adds to)

a) M: 45
A: 18

$$+1, +45 = 46$$

$$\boxed{3, 15} = 18$$

$$5, 9 = 14$$

b) M: -132
A: +1

$$-1, +132 = 131$$

$$-2, +66 = 64$$

$$-3, +44 = 41$$

$$-4, +33 = 29$$

$$-6, +22 = 16$$

$$\boxed{-11, +12} = 1$$

① The sign on A = the sign on B
② If M = +, same signs
If M = -, opposite signs.

c) M: 60
A: -23

$$-1, -60 = -61$$

$$-2, -30 = -32$$

$$\boxed{-3, -20} = -23$$

A = B

e) M: -216
A: -19

$$+1, -216 = -215$$

$$2, -108$$

$$3, -72$$

$$4, -54$$

$$6, -36 = -30$$

$$\boxed{8, -27} = -19$$

Success Criteria:

- I can use the distributive property to expand larger polynomials
- I can find all of the factor pairs for a given number
- I can find a specific factor pair that meets a set of conditions