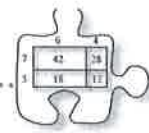


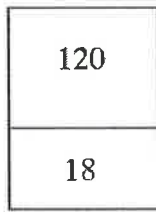
2.3.3 How can I understand products?

Generic Rectangles and Greatest Common Factor



When you solve a puzzle, is there always one answer? In a number puzzle there may be more than one answer that fits the clues. As you complete the problems below, think about whether there is more than one way to solve a problem and how you know this to be true.

2-70. There are several ways to write the length and width dimensions of the rectangle at right.

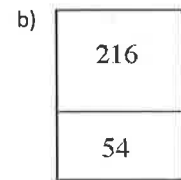
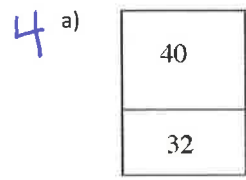


$6(20+3)$

- a) How many ways can you write the dimensions of the generic rectangle at right? Draw a new rectangle for each way.
- b) The factor on the short side of each of the rectangles you drew in part (a) had to be a factor of both 120 and 18. When two products share the same factor, that factor is called a **common factor**. What do you think is meant by the **greatest common factor** of 120 and 18? What is the GCF for 120 and 18?

2-71. In problem 2-70, the greatest common factor and its generic rectangle could be used to write a multiplication sentence with parentheses: $120 + 18 = 6(20 + 3)$

For each generic rectangle below, draw as many rectangles with different dimensions as you can. Then use the greatest common factor for the numbers in each rectangle to write a multiplication sentence with parentheses.



$8(5+4)$

Challenge- can you find all 8?

2-72. Ethan thinks that $5(13)$ can be found by adding $50 + 15$.

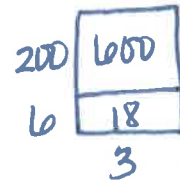
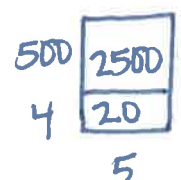
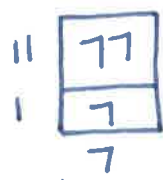
- a) Is Ethan correct? Draw a diagram to demonstrate Ethan's idea or show where he went wrong.
- b) Write a multiplication sentence with parentheses to represent Ethan's generic rectangle.

2-73. Use Ethan's idea to draw a generic rectangle to find each product below. Then write a multiplication sentence with parentheses for each one.

a) $7(1 + 11)$

b) $5(500 + 4)$

c) $3 \cdot 206$



$3(200+6) = 600 + 18$

$54(1+4)$

$7(1+11) = 7 + 77$
 84

$5(500+4) = 2500 + 20$
 2520

2-70

a)

b)

2-71

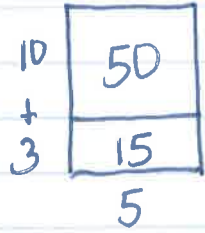
a)

b)

211
 $+$
 5

24
 $+$
 6

2-72



a) yes, Ethan is correct.

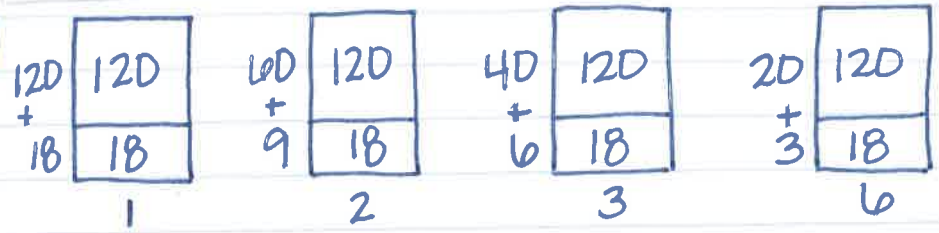
b) $5(10+3) = 50 + 15$

2-73

Front

2-70

a)

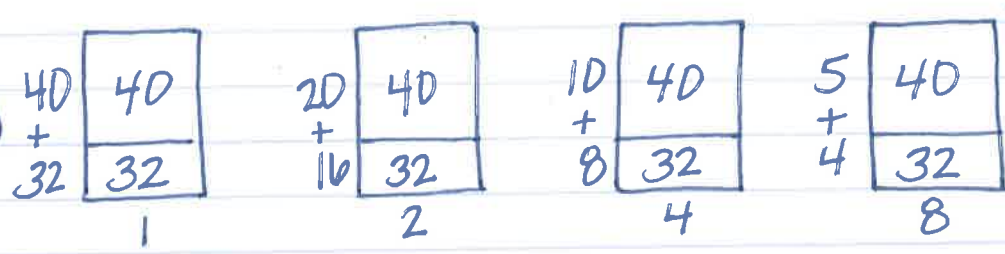


6(20+3)

b) I think GCF (greatest common factor) means the largest shared factor. The GCF of 120 and 18 is 6.

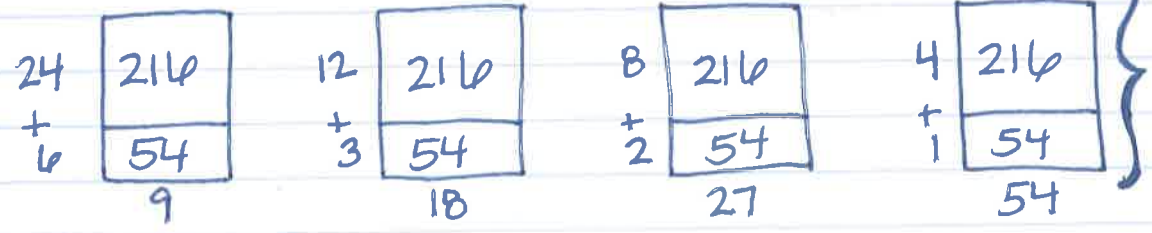
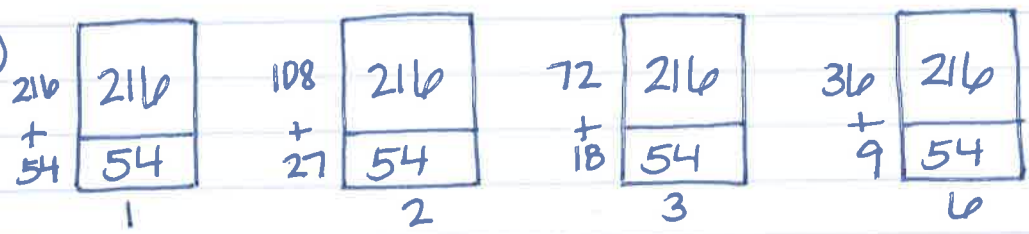
2-71

a)



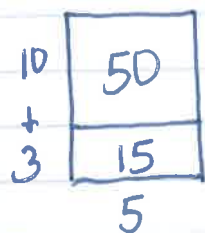
8(5+4)

b)



54(1+4)

2-72



a) yes, Ethan is correct.

b) $5(10+3) = 50 + 15$

2-73

Front