

Multiplication and division



Problem #1



- You are about to paint your house inside and out. The inside colors you're thinking of are pale green, yellow, light blue and red. Outside options are yellow, orange and brown. If you only choose one color for inside and one for the outside, how many different ways can you paint your house? Is there a systematic way to represent all the color combinations?

Exercise #1:



- Find following products using properties of multiplication we just talked about:
 - 45×11
 - 97×101
 - $21 \times 17 - 13 \times 17$

Problem #2



Find the products below and explain what is happening.

- $12345679 \times 9 = 111111111$
- $12345679 \times 18 = 222222222$
- $12345679 \times 27 = \underline{\hspace{2cm}}$
- $12345679 \times 63 = \underline{\hspace{2cm}}$
- $12345679 \times 81 = \underline{\hspace{2cm}}$

Explanation #1



- Is $6 \times (7 \cdot 3)$ equal to $(6 \cdot 7) \times (6 \cdot 3)$? Explain.
- Is a subset of whole numbers that is closed under multiplication necessarily closed under addition?

Problem #3



- Andrew and Bert met on the street and had the following conversation:
 - A: How old are your three children?
 - B: The product of their ages is 36.
 - A: That's not enough information.
 - B: The sum of their ages is your house number.
 - A: That's still not enough information.
 - B: The oldest child plays piano.
 - A: Now I know.
- Assume that the ages are whole numbers and that twins have the same age. What was Andrew's house number?

Explanation #2



- Find

$$\begin{array}{r} 213 \\ \times 28 \\ \hline \end{array}$$

Choose a person in your group who will explain their method and why it works to the rest of the group while everybody else will be carefully listening and comparing to their own method and deciding whether they would explain it differently. If you would, then share with the rest what your explanation would be.

Reading mathematics



I	II	III
47	47	47
<u>x 13</u>	<u>x 13</u>	<u>x 13</u>
21	141	141
120	<u>470</u>	<u>47</u>
70	611	611
<u>400</u>		
611		

Representation



- How can you represent the following problems:
 - There are 20 children going on a school trip. The school got 4 minivans for the trip. If we wanted equal number of children in each vehicle how many should we put in each?
 - There are 20 kids going on a school trip. How many vehicles does the school need to get if we want to put 4 kids in each?
- What is similar about these two problems and what is different?

Exercise #2



- Find the quotient and remainder in each:
 - $55 \div 12$
 - $48 \div 8$
 - $54 \div 6$

Explanation #3



- A student says: "If I want to divide 21 by 6, I just keep subtracting 6 until I get a number less than 6 and that's my answer." How would you respond to this student?
- How many possible remainders are there if you are dividing by
 - a) 2 b) 12 c) 62 d) 23?

Explanation



- Model $573 \div 4$ using base 10 blocks.