Math 3, Classwork 12

WARM-UP

1. Multiplication Gym

2. Calculate:

$7 \times 6 + 2 \times 4 =$ _____ $5 \times 6 - 3 \times 4 =$ _____

3. Compare, using <, >, =:

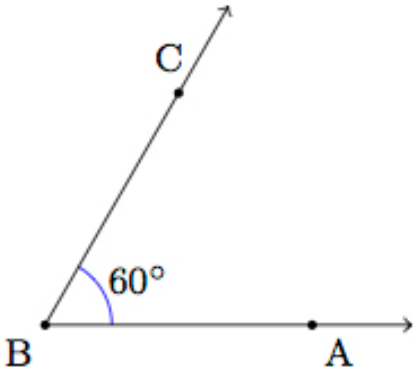
$45 + (18 - 9) \ldots 45 - 18 - 9$ $24 + (16 - 7) \ldots 24 + 16 + 7$

$61 - (14 + 18) \ldots 61 - 14 + 18$ $83 - (63 - 14) \ldots 83 - 63 + 14$

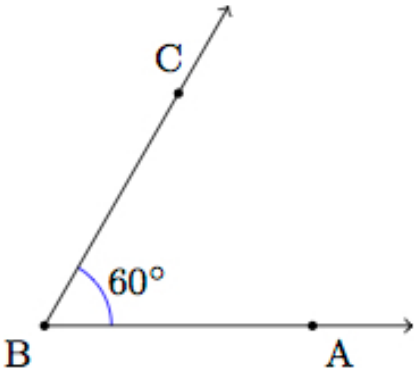
REVIEW I

4. Look at the angle that drawn below and measures 60 degrees.

a)



b)



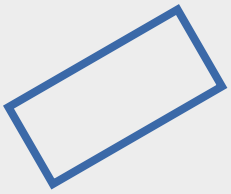
a) Draw another angle that measures 25 degrees. It should have the same vertex and share side $\overrightarrow{BA}$.

How many angles are there in the figure you drew? What are their measures?

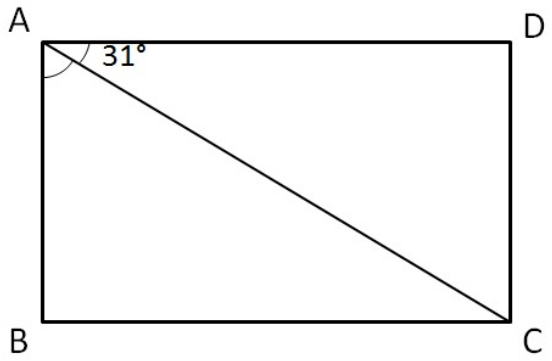
b) On the copy of your 60-degree angle draw a different angle that measures 25 degrees and has the same vertex and also shares side $\overrightarrow{BA}$.

How many angles are there in the figure you drew? What are their measures?

5. Look at each figure. Place an X in the box if it appears to describe the figure pictured.

				
4 vertices				
Four sides				
Opposite sides parallel				
Perpendicular sides				
Opposite sides have equal length				
All sides have equal length				
Contains right angle(s)				
Contains acute angle(s)				
Contains obtuse angle(s)				

6. In the figure, $ABCD$ is a rectangle and $\angle CAD = 31°$. Find $\angle BAC$



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NEW MATERIAL

Division

In mathematics, the word "**division**" means the operation which is the opposite of multiplication, The symbol for division can be a slash, a line, or the division sign (÷), as in:

$$6/3 \qquad \text{or} \qquad \frac{6}{3} \qquad \text{or} \qquad 6 \div 3$$

Each of those three, means "6 divided by 3" giving 2 as the answer. The first number is the **dividend** (6), and the second number is the **divisor** (3). The result (or answer) is the **quotient.**

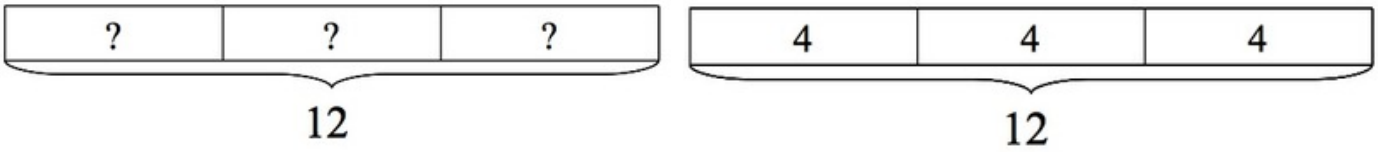
Two meanings of division:

Example 1. Lets consider two problems:

1. Julia cuts 12 feet of ribbon into 3 equal pieces so she can share it with her two friends. How long is each piece?
2. Julia has 12 feet of ribbon and wants to wrap some gifts. Each gift needs 3 feet of ribbon. How many gifts can she wrap using the ribbon?

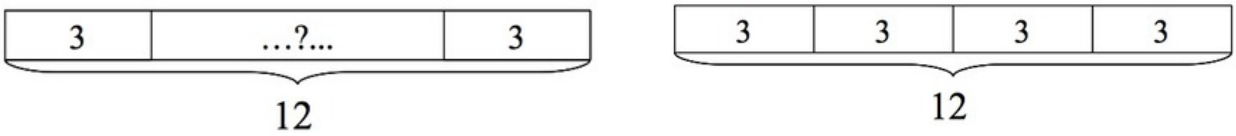
Solution I: Tape Diagram

1. In the 1st problem the question asks: "how long is each piece?", so it is a "How many in each group?" division problem. $3 \times ? = 12$



$12 \div 3 = 4$, so each child gets a piece of ribbon that is 4 feet long.

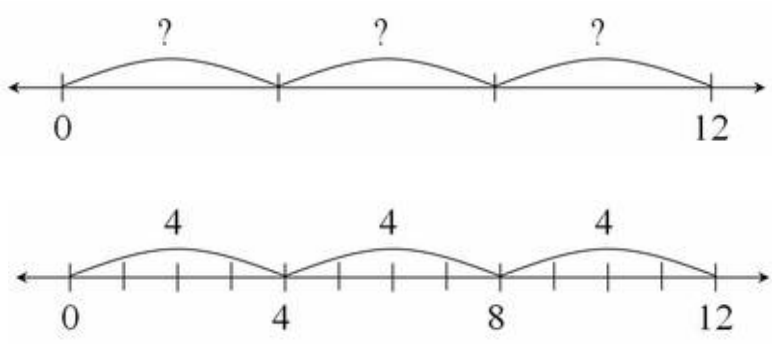
2. In the 2nd problem the question asks: "how many pieces does one get?", so it is a "How many groups?" division problem. $? \times 3 = 12$



$12 \div 3 = 4$, so Julia can wrap 4 gifts.

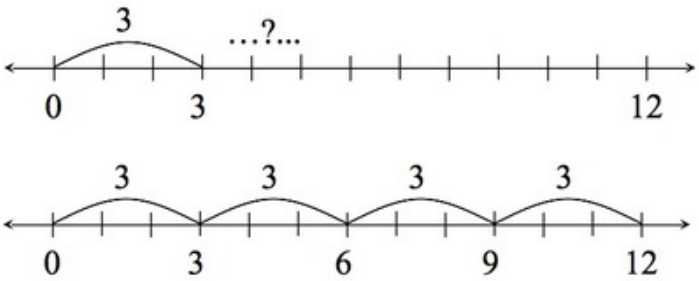
Solution II: Number Line

1. In the 1st problem the question asks: "how long is each piece?", so it is a "How many in each group?" division problem. $3 \times ? = 12$



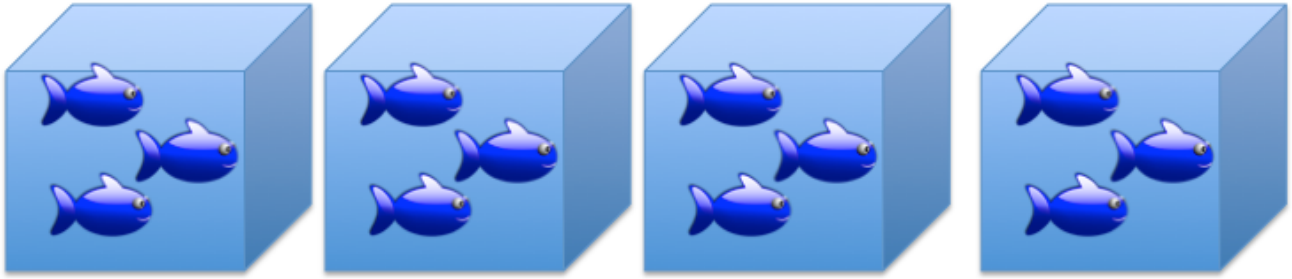
$12 \div 3 = 4$, so each child gets a piece of ribbon that is 4 feet long.

2. In the 2nd problem the question asks: "how many pieces does one get?", so it is a "How many groups?" division problem. $? \times 3 = 12$



$12 \div 3 = 4$, so Julia can wrap 4 gifts.

7. Suppose there are 4 tanks and 3 fish in each tank. The total number of fish in this situation can be expressed as $4 \times 3 = 12$.



1. Describe the problem being solved in this situation: $12 \div 3 = 4$
2. Describe the problem being solved in this situation: $12 \div 4 = 3$

8. Describe $12 \div 6 = 2$ in 2 different ways. Draw 2 different pictures to support your descriptions (use any objects – balls, balloons, apples, something what is easy to draw):

1. _____
_____

2. _____
_____

9. Answer questions and check your answers:

1. How many 5s are in 15? _____
2. How many 4s are in 24? _____
3. How many 10s are in 100? _____
4. How many 3s are in 60? _____

Multiplying by Bigger Numbers: "One – Digit – One – Line" method

When multiplying by two-digit number, we do two **"One – Digit – One – Line"** multiplications.

We can also use a "partial products" method.

Example: 179 × 64

4 5
~~3~~ ~~3~~

$$\begin{array}{r} 179 \\ \underline{\times\ 64} \\ 716 \\ \underline{+\ 10{,}740} \\ 11{,}456 \end{array}$$

Here is the answer using the partial products algorithm:

$$\begin{array}{rr} & 179 \\ & \underline{\times\ 64} \\ 9 \times 4 = & 36 \\ 70 \times 4 = & 280 \\ 100 \times 4 = & 400 \\ 9 \times 60 = & 540 \\ 70 \times 60 = & 4200 \\ 100 \times 60 = & \underline{+6000} \\ & 11{,}456 \end{array}$$

Here is a rectangle with side lengths 100+70+9 and 60+4
that shows all of the partial products as the area of part of the rectangle:

	100	70	9
60	60 x 100 = 6,000	60 x 70= 4,200	60 x 9 = 540
4	4 x 100= 400	4 x 70= 280	4 x 9 = 36

$$\begin{array}{r} 6{,}000 \\ 4{,}200 \\ 540 \\ 400 \\ 280 \\ +\quad 36 \\ \hline 11{,}456 \end{array}$$

10. Multiply:

$321 \times 22 =$ $482 \times 36 =$ $503 \times 84 =$

11. Solve equations:

$7 \times x = 56$ $28 \div c = 4$ $a \div 9 = 4$

Did you know …

Multiplication table – rows with patterns – multiplying by 5's and 9's

1. Let's start with the x5's. The first 10 multiples of 5 are:

5, 10, 15, 20, 25, 30, 35, 40, 45, 50

Pattern is obvious: The even numbers all end in zero: 10, 20, 30, 40, …

It makes sense since every two 5's gives us another 10. The odd numbers multiplying by 5's all end in five. Use those 2 rules to count quickly:

$4 \times 15 = 6\underline{0}$ $2 \times 125 = 25\underline{0}$ $21 \times 5 = 5\underline{5}$

2. The pattern in the multiplication by 9's is even simpler!

Read the first ten multiples of 9 are 9, 18, 27, 36, 45, 54, 63, 72, 81, 90 aloud.

For the ones place, we see that 9 has 9 ones, 18 has 8 ones, and going through the list we get ones values of 9, 8, 7, 6, 5, 4, 3, 2, 1, 0.

So the tens place starts at 0 and go up by 1 while the ones place starts at 9 and goes down by 1: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

The first digit of the product is one less that the number you are multiplying by, and the second is whatever you need, to make the two digits add up to 9.

For example: $9 \times 4 = 36$. It fits the pattern because 3 is one less that 4 and you need 6 to be added to 3 to make a sum of both numbers equal 9.

$9 \times 6 = 54$ $9 \times 9 = 81$ $9 \times 7 = 63$

3. There is a finger trick as well, which is very useful. To multiply 9 x 6, you should put the sixth finger down and look at your hands. You will have 5 fingers up on one side of the down finger and 4 on the other.