Math 2   Classwork 15

Warm Up

1

a) Put all weights in order from the lightest to heaviest:

2kg 100g,   1kg 900g,   550g,   55kg,   5,500g,   5kg 50g

_____

b) Put all lengths in order from the largest to smallest:

5m 5dm,   550dm,   555cm,   5dm 5cm,   505cm

_____

2

Enter in a missed number to make an equation correct:

$23 + 24 + \_\_\_ = 80$ $23 + \_\_\_ + 32 = 80$ $23 + \_\_\_\_ + 15 = 80$

3

Calculate smartly (the most convenient way):

$158 + 217 - 42 =$ $228 + 118 + 82 =$ $294 + 106 + 94 =$

Homework Review

4

What types of angles are formed by the hour hand and the minute hand on the clock face at the following times (right, obtuse, acute, straight) ?

a) 3 o'clock - angle _____   b) 4 o'clock - angle _____

c) half past 9 - angle _____   11 o'clock - angle _____

5

What is the greatest number you can write in the box?

$\square$ + 8 < 12   11 − $\square$ > 6   14 + $\square$ < 20

100 > $\square$ 9 $\square$ 3 < 32   51 > 5 $\square$

New Material I

Multiplication

Question: if we have 4 cars, and there are 3 persons in each car, how many people do we have altogether?

The answer can be obtained either by adding four times 3: $3 + 3 + 3 + 3 = 12$
or by using operation of multiplication:
Instead of writing $3 + 3 + 3 + 3$ (4 times), we write **3 × 4**
The simple multiplication can be understood intuitively as a repeated addition.

6

Express the sum as a multiplication (do not calculate):

$2 + 2 =$ _____ $3 + 3 =$ _____ $100 + 100 =$ _____

Conclusion: Multiplication by 2 doubles any numbers.

7

Each group of coins contains 4 coins and there are 5 groups.

Altogether there are $\underbrace{4 + 4 + 4 + 4 + 4 = 20}_{5 \text{ times}}$ coins

Counting the same coins by multiplication yields: **4 × 5 = 20**

8

Compare without calculating the values:

$2 + 2 + 2 + 2$ ___ $2 × 5$ $3 × 4$ ____ $4 + 4 + 4$ $3 × 4$ ____ $3 + 3 + 3$

$3 × 4 + 4$ ____ $4 + 4 + 4$ $5 × 3$ ___ $5 + 5 × 2$ $4 × 5$ ____ $2 × 5 + 2 × 5$

Multiplying two whole numbers gives a ***product***. The numbers that we multiply are ***the factors of the product.***

Example: $3 \times 4 = 12$ therefore, 3 and 4 are the factors of 12.

Also $2 \times 6 = 12$, so 2 and 6 are also factors of 12,

And $1 \times 12 = 12$, so 1 and 12 are factors of 12 as well.

9

a) In each equation, underline the factors of the products and circle the products.

1 x 5 = 5   2 x 5 = 10   1 x 5 = 5   4 x 5 = 20

b) Express each multiplication is a repetitive sum.

Example: $2 \times 5 = 5 + 5 = 2 + 2 + 2 + 2 + 2$

$1 \times 5 =$ _____

$3 \times 5 =$ _____

$2 \times 6 =$ _____

REVIEW I

Linear, Branching and Cycling Algorithms

10

Linear algorithm:

a	5	14	20
x			

3
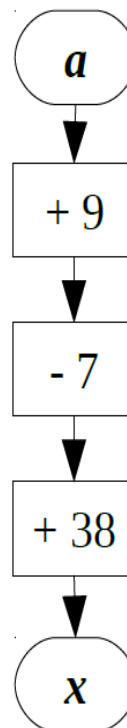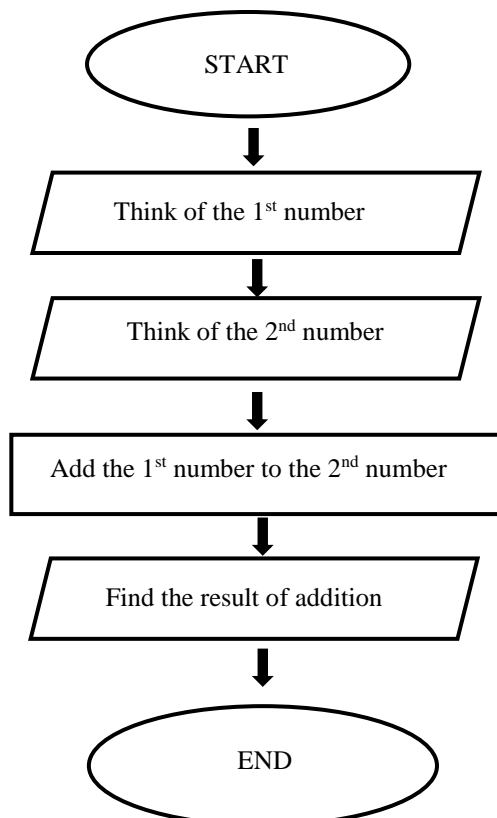
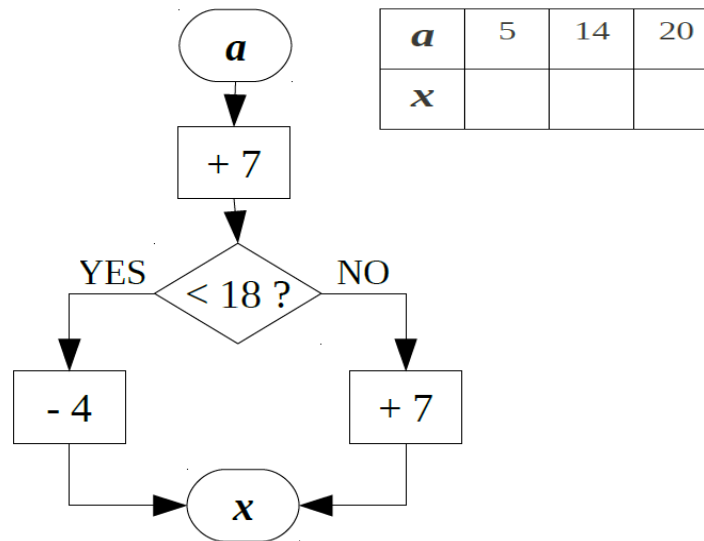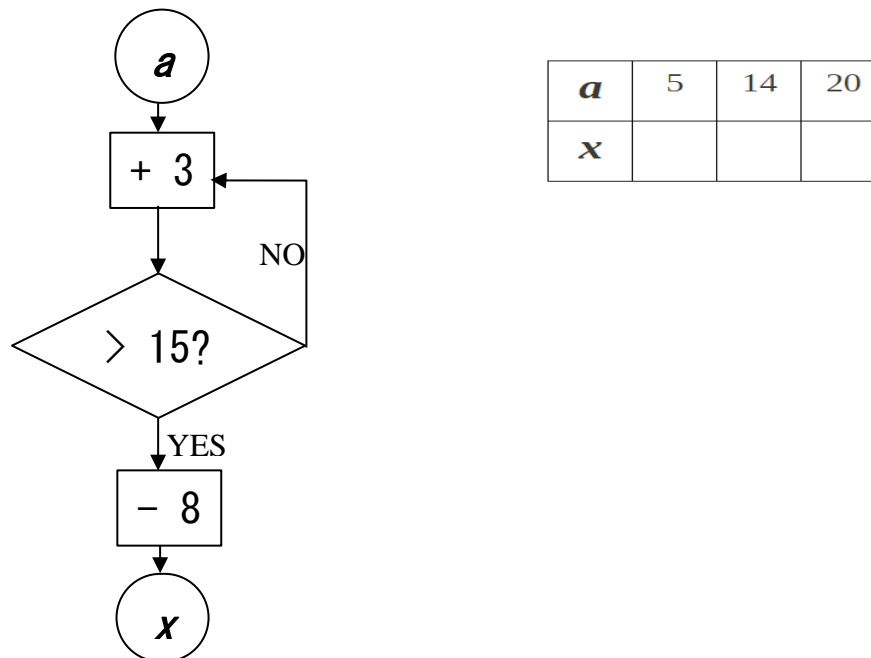**11**

Lets perform the actions according to the algorithms in the drawing below.
This algorithm is **branching algorithm**. Can you explain why and how it is different from the linear algorithm?

a	5	14	20
x			

12

Cycling Algorithms have a loop where you might go around again and again on the same path

a	5	14	20
x			

A linear algorithm is a step-by-step instruction, and the order of those instructions is essential.

A branching algorithm contains a decision making point to choose a path.

A Cycling algorithm: In some programs, certain steps are performed again and again based upon the conditional test, or performed more than one time. Those steps are called a loop.

REVIEW II

1. Adding number to a sum $\qquad$ *(33 + 74) + 26 = 33 + (74 + 26) = 33 +100 = 133*

2. Subtracting number from a sum $\qquad$ *(137 + 92) – 37 = (137 – 37) + 92 = 100 + 92 = 192*

(137 + 92) – 37 = (92 – 37) + 137 = 55 + 132 = 192

3. Subtracting a sum from a number $\qquad$ *128 – (28 + 14) = (128 – 28) - 14 = 100 - 14 = 86*

128 – (28 + 14) = (128 – 14) - 28 = 114 - 28 = 86

13 Calculate smartly (the most convenient way):

$75 - (34 + 25) =$ _____

$91 - (71 + 15) =$ _____

$(29 + 36) - 19 =$ _____

$(13 + 57) - 47 =$ _____

$2 + (36 + 98) =$ _____

$81 + (9 + 27) =$ _____

14 There were *a* liters of water in the 1ˢᵗ bucket and *b* liters of water in the 2ⁿᵈ bucket. A gardener used *c* liters of water to water his garden. How many liters of water remained in both buckets total?" There are three different methods to solve this problem. Let's consider all of them.
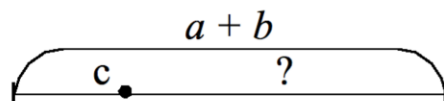
Method I : $(a + b) - c$
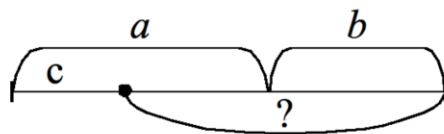
Method II : $(a - c) + b$
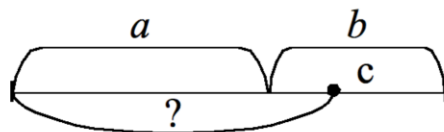
Method III : $a + (b - c)$

$$(a + b) - c = (a - c) + b = (b - c) + a = a + b - c$$

Did you know …

Algorithms have a long history. The word can be traced back to the 9th century.

At this time, the Persian scientist, astronomer, and mathematician Abdullah Muhammad bin Musa al-Khwarizmi, often cited as "The father of Algebra," was indirectly responsible for creating the term "Algorithm." In the 12th century, one of his books was translated into Latin, where his name was rendered in Latin as "Algorithm." But this was not the beginning of algorithms.

In 1600 BC - Babylonians develop the earliest known algorithms. The concept of the algorithm was formalized in 1936 through Alan Turing's Turing machines, which in turn formed the foundation of computer science.