FUNCTIONS AND RELATIONSHIPS

NOTES & ACTIVITIES

GRADE 8

Name and surname: _____

1. VARIABLES AND CONSTANTS

TERMINOLOGY

A quantity that changes is called a **VARIALBE QUANTITIY**, or just a **VARIABLE**.

A quantity that never changes is called a **CONSTANT QUANTITIY**, or just a **CONSTANT**.

A rule that shows the relationship between the input values and output values so that for **EACH INPUT VALUE THERE IN ONLY ONE OUTPUT VALUE**.

CONNECTIONS BETWEEN QUANTITIES



EXAMPLE 1

Consider the following TWO situations. There are two quantities in each situation. For each quantity, state whether it is constant (always the same number) or whether it changes.

1. Your age and the number of fingers on your hands.

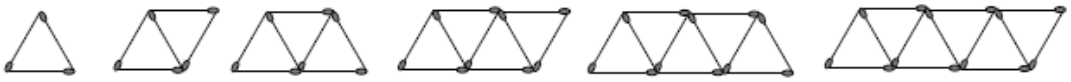
2. The number of learners at school and the amount of hours in a school day.

EXERCISE 1

Consider the following FOUR situations. There are two quantities in each situation. For each quantity, state whether it is **constant** (always the same number) or whether it **changes**.

1. The number of calls you make and the airtime left on your cell phone.
2. The size of your eyes and your ability to finish Mathematics test quickly.
3. The number of learners at a school and the number of classrooms needed.

4. The number of matches in each arrangement, and the number of triangles in the arrangement.



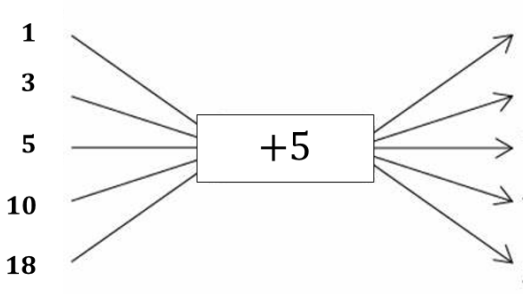
2. FLOW DIAGRAMS

TERMINOLOGY

Each input number in a flow diagram has a corresponding output number. The first input number corresponds to the first output number. The second input number corresponds to the second output number and so on. We call +5 the operator.

EXAMPLE 1

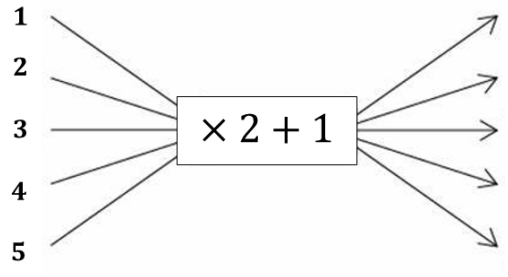
Let's determine the output values:



EXAMPLE 2

You are given input numbers, multiply it by 2 and add 1.

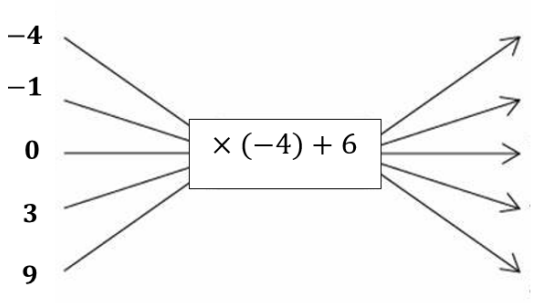
Let's determine the output values:



EXAMPLE 3

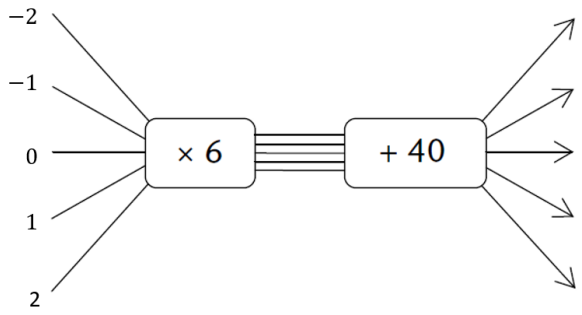
You are given input numbers, multiply it by −4 and add 6.

Let's determine the output values:



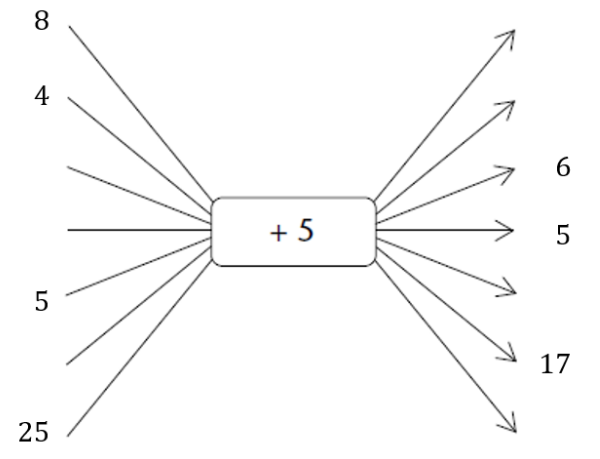
EXAMPLE 4

Complete the following flow diagrams.



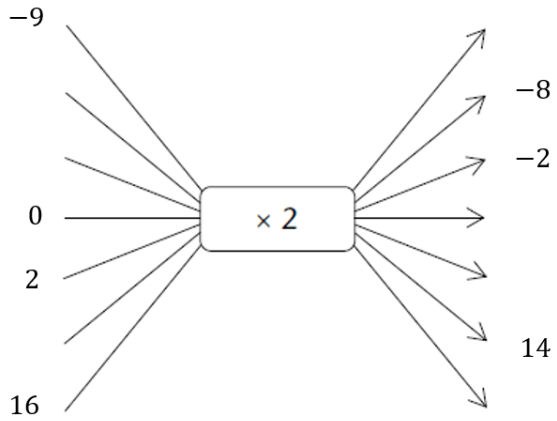
EXAMPLE 5

Complete the following flow diagrams:



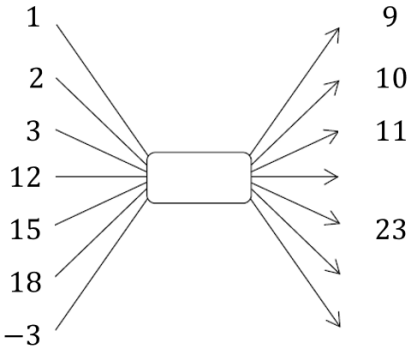
EXAMPLE 6

Complete the following flow diagrams:



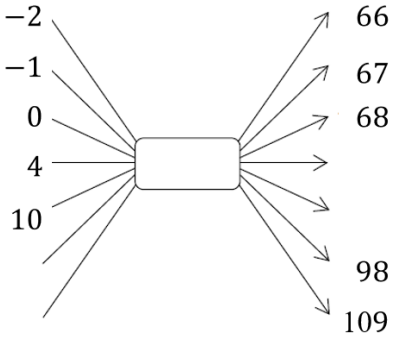
EXAMPLE 7 A

Complete the following flow diagrams. You must determine the rule first.



EXAMPLE 7 B

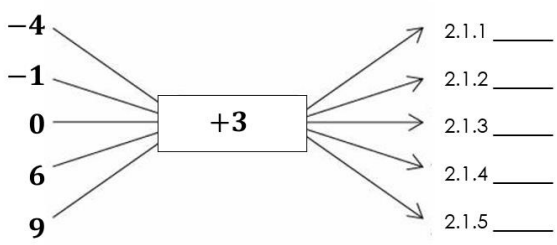
Complete the following flow diagrams. You must determine the rule first.



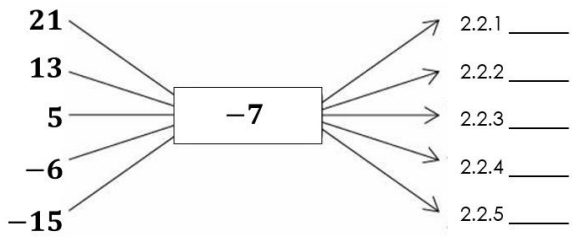
EXERCISE 2



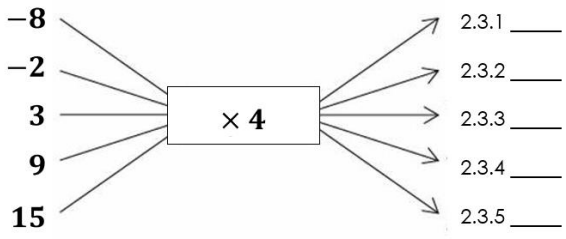
2.1 Complete the following flow diagram.



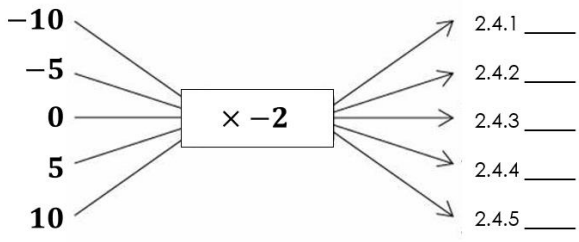
2.2 Complete the following flow diagram.



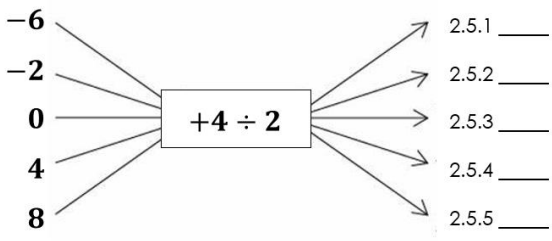
2.3 Complete the following flow diagram.



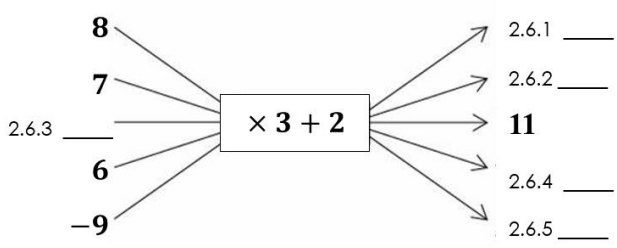
2.4 Complete the following flow diagram.



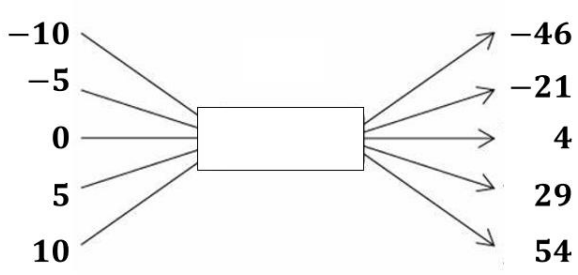
2.5 Complete the following flow diagram.



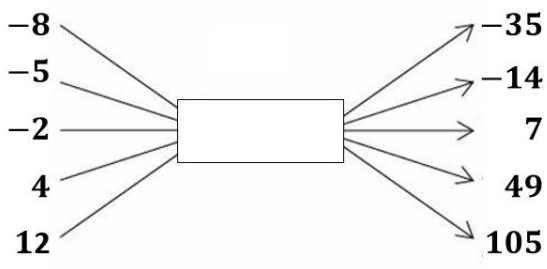
2.6 Complete the following flow diagram.



2.7 Write down the rule used to find the output values in each of the following flow diagrams.



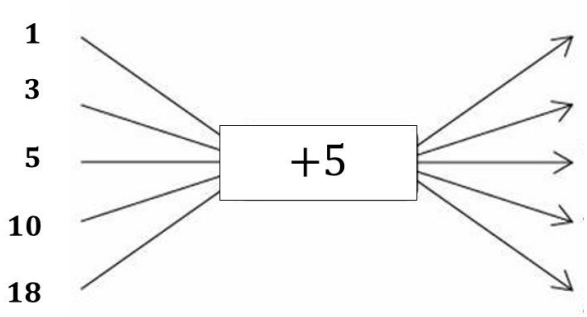
2.8 Write down the rule used to find the output values in each of the following flow diagrams.



3. TABLES

EXAMPLE 1

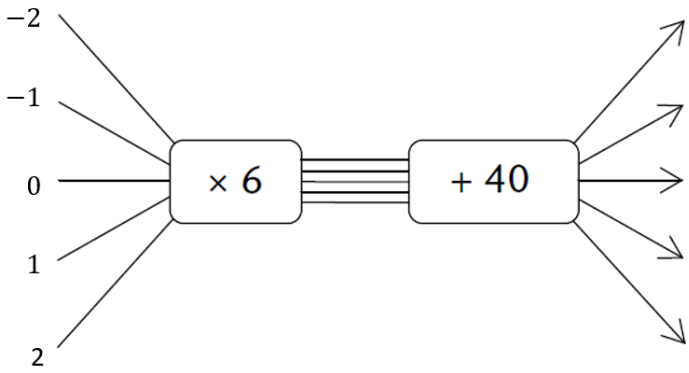
We can also represent the information from a flow diagram in a table.



Input	1	3	5	10	18
Output					

EXAMPLE 2

We can also represent the information from a flow diagram in a table.

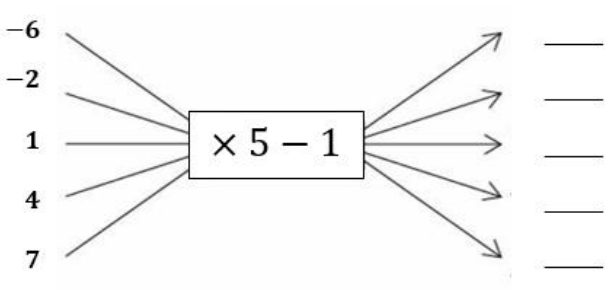


Input	**−2**	**−1**	**0**	**1**	**2**
Output					

EXERCISE 3

3.1.1 Complete the following flow diagram:





3.1.2 Represent your information from the flow diagram in 3.1.1 in a table.

Input	**−6**	**−2**	**1**	**4**	**7**
Output					

3.1.3 Describe in words how to calculate the output number for any input number.

_____

_____

3.2 This question is about the relationship between two variables. Some information about the relationship is given in the flow diagram below.



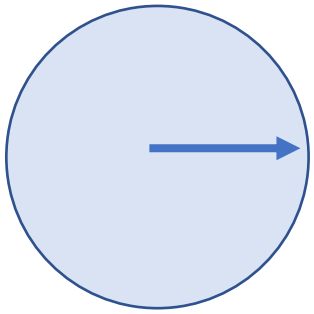
3.2.1 Use the instructions in the flow diagram to complete the table.

Input	**−3**	**−1**	**0**	**5**	**12**
Output					

3.2.2 Describe in words how to calculate the output number for any input number.

_____

_____



3.3 The circumference of a circle can be given as $2\pi r$.

3.3.1 Use the formulae to complete the table if the radius (r) is given. Give your answer in terms of π.

r	1	3	7	11	15
Circumference					

3.3.2 Describe in words how to calculate the circumference for any circle given.

_____

_____