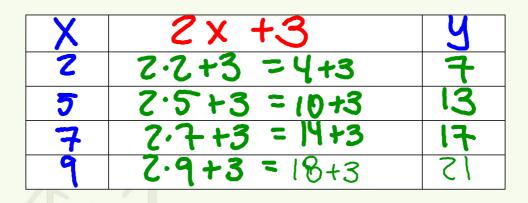## 1.7   Words, Equations, Tables, and Graphs

You have already seen that a relation may be represented as a set of ordered pairs.

You can also write a rule for the operation(s) performed on the domain value to get the range value.
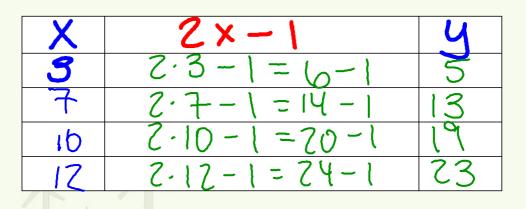
A table may list the x-coordinates (domain values), the rule, and the y-coordinates (range values).

<u>Example:</u> Make a table for four different domain values & write an algebraic expression for the rule.

"double a number then add three"

X	2x +3	y
2	$2 \cdot 2 + 3 = 4 + 3$	7
5	$2 \cdot 5 + 3 = 10 + 3$	13
7	$2 \cdot 7 + 3 = 14 + 3$	17
9	$2 \cdot 9 + 3 = 18 + 3$	21

State the domain & range of the relation.

Domain: 2, 5, 7, 9

Range: 7, 13, 17, 21

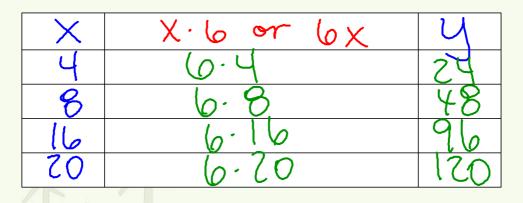<u>Example:</u> Make a table for four different domain values & write an algebraic expression for the rule.

"double a number, then subtract one"

X	$2x - 1$	y
3	$2 \cdot 3 - 1 = 6 - 1$	5
7	$2 \cdot 7 - 1 = 14 - 1$	13
10	$2 \cdot 10 - 1 = 20 - 1$	19
12	$2 \cdot 12 - 1 = 24 - 1$	23

State the domain & range of the relation.

Domain: 3, 7, 10, 12

Range: 5, 13, 19, 23

<u>Example:</u> Make a table for four different domain values & write an algebraic expression for the rule.

The team scores 6 points for each touchdown

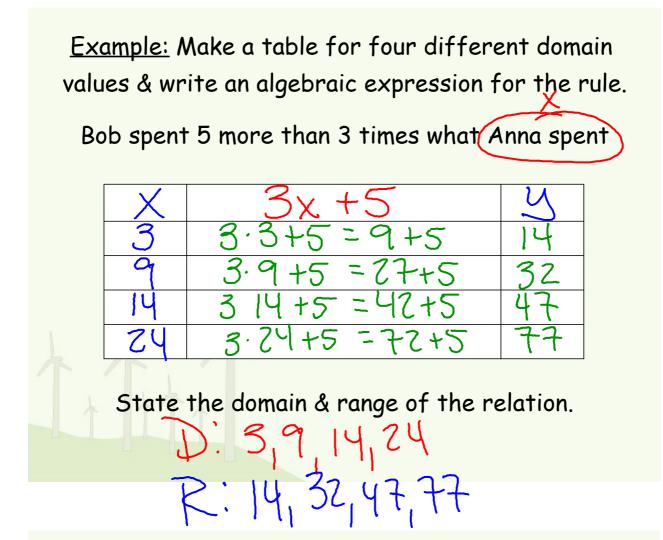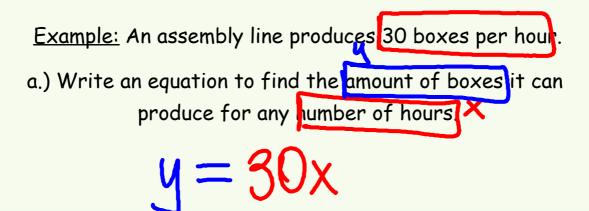| X	X·6 or 6X	y
4	6·4	24
8	6·8	48
16	6·16	96
20	6·20	120

State the domain & range of the relation.

Domain: 4, 8, 16, 20

Range: 24, 48, 96, 120

<u>Example:</u> Make a table for four different domain values & write an algebraic expression for the rule.

Bob spent 5 more than 3 times what (Anna spent)

X	$3x + 5$	y
3	$3 \cdot 3 + 5 = 9 + 5$	14
9	$3 \cdot 9 + 5 = 27 + 5$	32
14	$3 \cdot 14 + 5 = 42 + 5$	47
24	$3 \cdot 24 + 5 = 72 + 5$	77

State the domain & range of the relation.

D: 3, 9, 14, 24

R: 14, 32, 47, 77

Words, equations, tables, and graphs can be used to represent relations.

An EQUATION is a mathematical sentence stating that two quantities are equal.

Relations are often written as equations with two variables - one to represent domain values and one to represent range values.

Example: An assembly line produces 30 boxes per hour.

a.) Write an equation to find the amount of boxes it can produce for any number of hours. ✗

$$y = 30x$$

b.) Make a table for 5, 10, 15, and 20 hours of production.

X	y = 30x	y
5	30·5	150
10	30·10	300
15	30·15	450
20	30·20	600

Example: The navigation message from a satellite to a GPS in an airplane is sent once every 12 minutes.

a.) Write an equation to find the number of messages sent in any number of minutes. ✗

$$y = x \div 12$$

b.) Make a table to find the number of messages in 120, 180, 240, and 300 minutes.

x	y = x ÷ 12	y
120	120÷12	10
180	180÷12	15
240	240÷12	20
300	300÷12	25