Expressions: a combination of letters and numbers and operations (+, -, x, ÷)

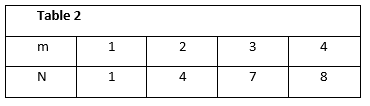
Ex 2b + 1 or 8 – 5g or -10x + 9

Variable: is the unknown in the expression

Ex. 3a – 5 the variable is the a

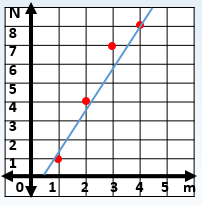
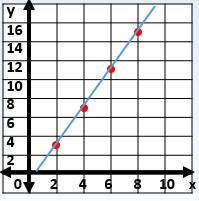
**How do you know if a relation is linear?**

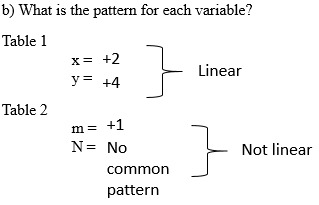
1. Look at the graph – does it create a straight line?
   * Do all the points move up/down and over left/right by the same amount?
   * If yes 🡪 linear relation!
2. Look at the table of values:
   * Do the “x” values go up by the same amounts?
   * Do the “y” values go up by the same amounts?
   * If yes to both 🡪 linear relation!

Example 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table 1** | | | | |
| x | 2 | 4 | 6 | 8 |
| y | 3 | 7 | 11 | 15 |

1. Graph the table of values





c) Which relations is linear?

Graph 1 is linear.

Graph 2 is not.

**How to Write Expressions of linear relations…**

If “x” and “y” have an ordered pair of zero (**0,0**):

1. If the relation is linear, describe the relationship between “x” and “y”.
   * Look at the “x” value of 1. How many more **times** bigger/smaller is “y”?
2. Write it as a **multiplication** to “x” 🡪 #“x”

Example 1

|  |  |
| --- | --- |
| **“x”** | **“y”** |
| 0 | 0 |
| 1 | 4 |
| 2 | 8 |

**If you multiply “x” by 4 you get “y”**

**Write the expression as 4x**

Example 2

**Find the expression for the following chart**

1. What is the difference in value in consecutive
   1. a-values +1
   2. B-Values +3
2. If linear, describe the relationship between a and B

Multiply by 3

|  |  |
| --- | --- |
| **a** | **B** |
| 0 | 0 |
| 1 | 3 |
| 2 | 6 |
| 3 | 9 |
| 4 | 12 |

c) What is the expression for B in terms of a

a x 3 or 3a

Example 3

**Find the expression for the following chart**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **x** | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| **y** | 5 | 10 | 15 | 20 | 25 | 30 | 35 |

1. What is the difference in value in consecutive
   1. x-values +1
   2. y-values +5
   3. If linear, describe the relationship between x and y

Multiply by 5

1. What is the expression for y in terms of x

5 • x “•” means multiply Or 5x

**How to Write Expressions of linear relations…**

If “x” has a value of zero (0) and “y” has a number value:

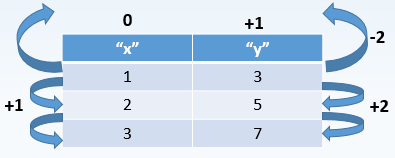
1. If the relation is linear, find the value of “y” when “x” = 0.
2. Find the pattern “y” is going up by.
   * This value will be **multiplied** to the “x” variable

3. Depending on what “y” is at x = 0, **add or subtract** this value to your variable term

Example:

**Expression:**

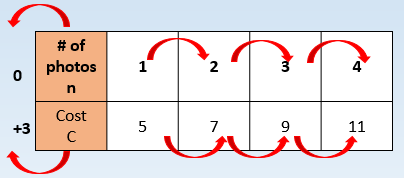
**2x + 1**



Example 4

Photo world charges $5 for the first enlargement and $2 for each additional enlargement. What is the cost of 15 enlargements?

1. Make a Table of Values b) Is this a linear relation? Yes



n = +1

C = +2

1. Write the expression for the cost in relation to the number of enlargements?

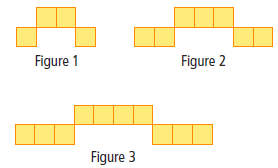
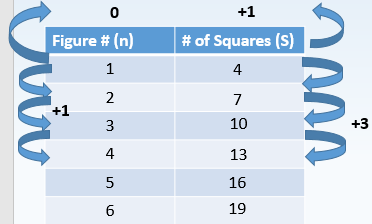
2n check? 🡪 not true 2n + 3

1. What is the cost of 15 enlargements?

C = 2n + 3

C = 2(15) + 3

C = 33 Cost of 15 photos would be $33.

*Example 5****:*** a) Make a table of values showing the figure numberand the number of squares for the first six figures.

1. Write an expression showing the number of squares in terms

of the figure number.

**# of squares going up by +3 every time Figure # goes up by +1; therefore 3n 🡪 3n + 1**

1. How many squares would appear in Figure 20?

**3n + 1 🡪 3(20) + 1 🡪 60 + 1 🡪 61**