Patterns, Functions and Algebra

Functions and Relationships 1 - Memo

1. Give the definitions for each of these terms:

   a) input value - *the value that changes the result*

   b) output value - *The value that results from the function*

   c) rules - *The function or steps to take in order to get the output value*

   d) flow diagrams – *diagrams that show what to do to an input value and its result.*

2. For each of the patterns given below give the rule in words, and as a number sentence.

   a) 1, 2, 3, 4, 5, 6… - *Add 1 to the previous term. Or, you can also say, it is the term position.*

   ___ = ___ (no change) or we can write ___ = 1 x ___

   b) 2, 4, 6, 8, 10, 12… - *Multiply the term position by 2.*

   ___ = 2 x ___

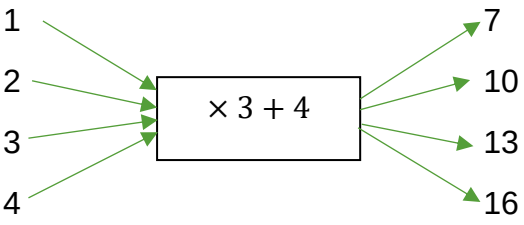
   c) 3, 5, 8, 12, 17, 23… - *Add the term position to the previous term's value*

   ___ = 3 + next term position

   d) 1, 4, 9, 16, 25, 36… - *Square the term position*

   ___ = ___^{2}

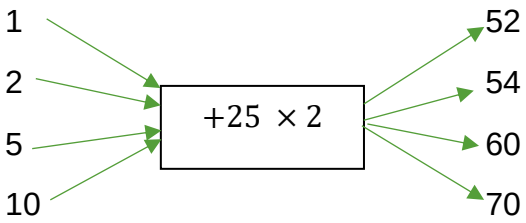
   e)



   In this pattern we first multiply the input value by 3 and then add 4 to that answer.

   ___ = 3 x ____ + 4

f)



First add 25 to the input value and then multiply that answer by 2.

___ = (25 + ___) x 2

g)

x	1	2	3	4	5
y	12	24	36	48	60

Multiply the x by 12

$y = 12x$ OR ___ = 12 x ___

h)

x	1	2	3	4	5
y	0	3	5	7	9

Multiply the x by 2 and then subtract 1.

$y = 2x - 1$ OR ___ = 2 x ___ - 1

i) $y = 2x + 5$

Multiply the term position (x) by 2 and then add 5.

___ = 2 x ___ + 5

j) $y = 100 - 5x$

Subtract the answer of 5 multiplied by the term position from 100.

____ = 100 – 5 x ____

k) $y = \frac{1}{2}x + \frac{3}{4}$

Multiply the term position by $\frac{1}{2}$ and then add $\frac{3}{4}$

___ = $\frac{1}{2}$ x ___ + $\frac{3}{4}$

l) $A = l \times b$

Area is equal to the length multiplied by the breadth

___ = ___ x ___

3. For each of the following functions, write the function in the form given in brackets first.

a) (words) 3, 4, 7, 11, 18, 29…

Add the previous two terms together to get the next term (this is a form of the Fibonacci sequence)

b) (table) $y = 80 - 3x$

Input	1	2	3	4	5
Output	77	74	71	68	65

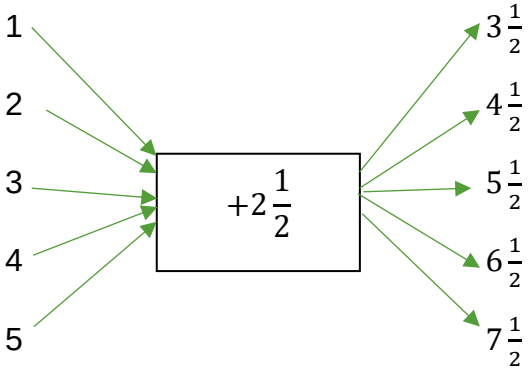
c) (number sentence)

Input	1	2	3	4	5
Output	2	4	6	8	10

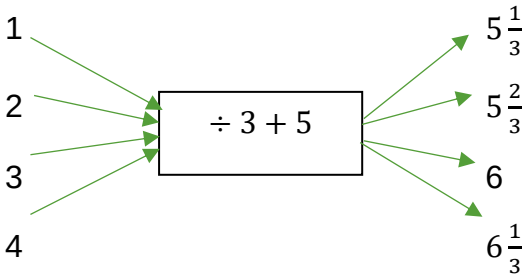
___ = 2 x ___

d) (flow diagram)

Input	1	2	3	4	5
Output	$3\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$



e) (formula)



$y = \frac{x}{3} + 5$ OR you can write: $y = x \div 3 + 5$

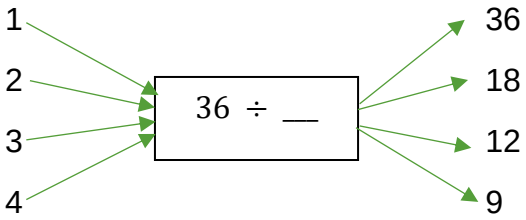
f) (formula) ___ = 8 x ___ + 2

$y = 8x + 2$

g) (words) ___ = 5 + ___ ÷ 2

Divide the term position by 2 and then add 5.

h) (flow diagram) $y = 36 \div x$



i) (table) $y = 4 \times x - 5$

Input	1	2	3	4	5
Output	-1	3	7	11	15

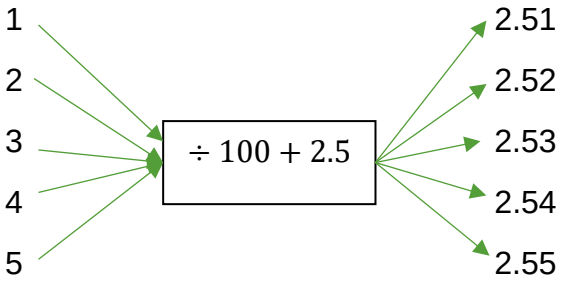
j) (number sentence)

Input	1	2	3	4	5
Output	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$

___ = ___ ÷ 4

k) (flow diagram and formula)

Input	1	2	3	4	5
Output	2.51	2.52	2.53	2.54	2.55



$y = \frac{x}{100} + 2.5$ OR $y = x \div 100 + 2.5$