

Linear and non-Linear Relationships

ACMNA296 – Assessment



Name: **Solutions**

Score: _____

Teacher: _____



Q.1. Which rule would produce the table of values:

x:	0	1	2	3	4
y:	3	5	7	9	11

- a) $y = x$ b) $y = 2x + 1$ c) $y = 2x + 3$ d) $y = x^2 + 3$ e) $x^2 + y^2 = 9$

Q.2. Determine the missing number (a) from the table:

x:	1	2	5	10
y:	2	5	a	29

$a = 14$

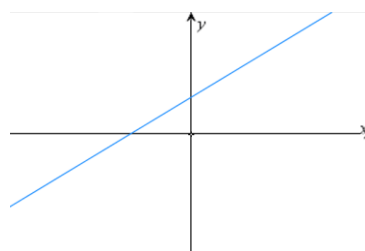
Q.3. From the table, write a rule relating x and y :

x:	2	4	6	8
y:	0	8	16	24

$y = 4x - 8$

Q.4. The equation for the graph opposite could be:

- a) $y = x^2 + 3$ b) $x^2 + y^2 = 4$
c) $y = 2x - 4$ d) $y = 3x + 3$
e) $x + y = 3$



Q.5. Which rule would produce the table of values:

x:	0	1	2	3
y:	4	5	8	13

- a) $y = x$ b) $y = x + 4$ c) $xy - 4x + 4 = y$ d) $y = 4x^2 + 4$ e) $y = x^2 + 4$

Q.6. Determine the missing number (a) from the table:

x:	0	1	2	3
y:	0	a	16	36

$a = 4$

Q.7. Let **shape** = x and **blocks** = y . Write a rule below for y in terms of x .

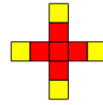
Shape = 1
Blocks = 1



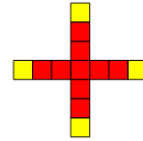
Shape = 2
Blocks = 5



Shape = 3
Blocks = 9



Shape = 4
Blocks = 13



$$y = 4x - 3$$

Q.8. Write a rule for the sum (y) of the first (x) odd numbers. The diagrams below may help formulate an answer.

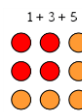
Sum of first '1' odd numbers.



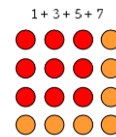
Sum of first '2' odd numbers.



Sum of first '3' odd numbers.



Sum of first '4' odd numbers.



$$y = x^2$$

Q.9. A rectangle is 5 units longer than it is wide. Write a rule for the **area** (a) of the rectangle in terms of the **width** (w). The sequence of examples below may help formulate an answer.

Width = 5cm

Length = 10 cm



Width = 5 .cm

Width = 7cm

Length = 12 cm



Width = 7 .cm

Width = 10cm

Length = 15 cm



Width = 10 .cm

$$a = w(w + 5)$$

Q.10. Let **shape** = x and **blocks** = y . Write a rule below for y in terms of x .

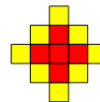
Shape = 1
Blocks = 1



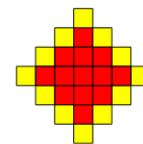
Shape = 2
Blocks = 5



Shape = 3
Blocks = 13



Shape = 4
Blocks = 25



$$y = 2x^2 - 2x + 1 \quad \text{or} \quad y = x^2 + (x-1)^2$$

Note: The second response can be generated visually by a number of means such as splitting the shape into two sections and considering the top section as $1 + 3 + 5 + 7 \dots$. And the bottom section being $1 + 3 + 5$ therefore x^2 and $(x-1)^2$ added together.