

Patterns, Equations, and Graphs Guide Notes

SOLUTION OF AN EQUATION containing two variables, x and y , is any ordered pair (x, y) that makes the equation true.

ORDERED PAIR – is a set of numbers or coordinates written in the form (x, y) . It can be used to show the position on a graph, where the x (horizontal) value is first, and the y (vertical) value is second.

Sample Problem 1: Tell whether the given order pair is a solution of each equation.

- A. Is $(30, 3)$ a solution of the equation $x - 14 = 5y$?

$$30 - 14 = 5(3)$$

$$30 - 14 = 15$$

$$16 \neq 16$$

- B. Is $(12, 5)$ a solution of the equation $4x + 2 = 10y$?

$$4(12) + 2 = 10(5)$$

$$48 + 2 = 50$$

$$50 = 50$$

- C. Is $(7, 1)$ a solution of the equation $8x - 6 = 50y$?

$$8(7) - 6 = 50(1)$$

$$56 - 6 = 50$$

$$50 = 50$$

There are various ways to show the relationship between two variables:

- A. Create a **TABLE** to show the corresponding values of x and y ,

Example: John is three years younger than his brother Matthew. Construct a table that represents their age.

John	Matthew
1	4
2	5
3	6
4	7

- B. Write an **EQUATION**, or.

Example: John is three years younger than his brother Matthew. Write an equation that represents their age.

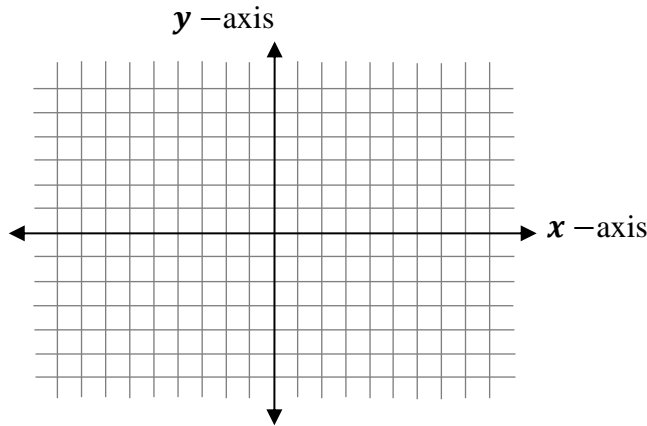
Let : J =John's age M =Matthew's age

$$J + 3 = M$$

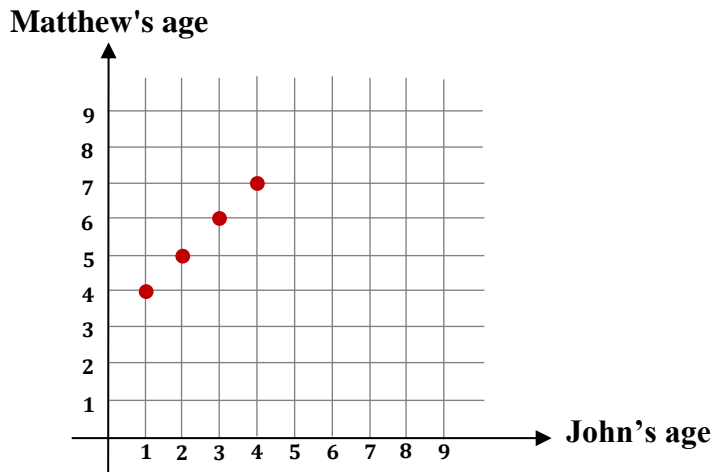
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C. Draw a **GRAPH**.

COORDINATE SYSTEM is a two-dimensional number line. This is a typical coordinate system: The horizontal axis is called the x -axis and the vertical axis is called the y -axis



Example: John is three years younger than his brother Matthew. Draw a graph that represents their age.



Sample Problem 2: Use a table, an equation, and a graph to represent the relationship of Mary's and Ann's age.

Mary is 2 years older than Ann.

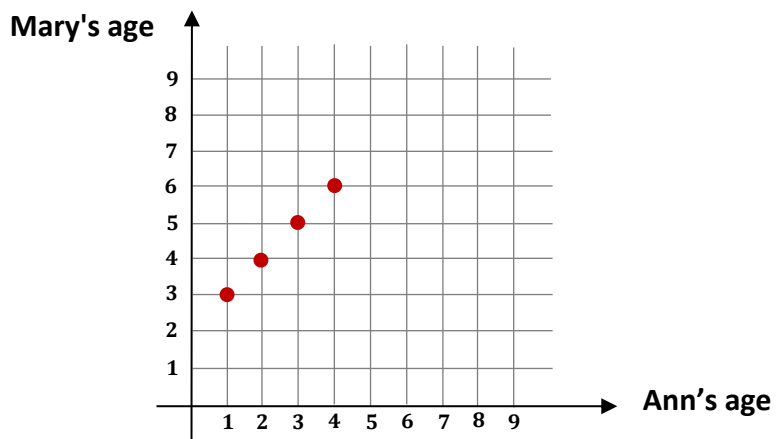
Mary	Ann
1	3
2	4
3	5
4	6

Let :

J = John's age

M = Mary's age

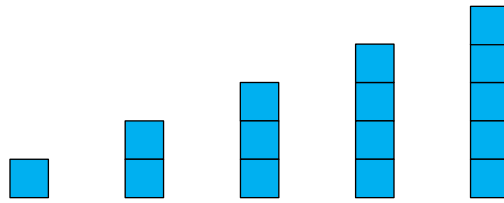
$A + 2 = M$



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INDUCTIVE REASONING is the process of reaching a conclusion based on an observed pattern. It is used to predict values.

Example 4: Predict the next figure in the given sequence.

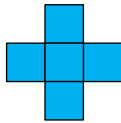


Sample Problem 3: Predict the next figure in the each sequence.

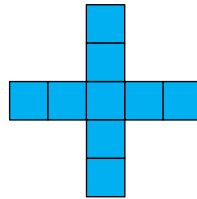
A.



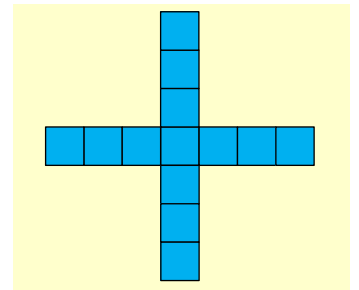
i.



ii.

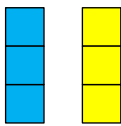


iii.

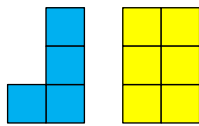


iv.

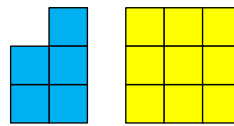
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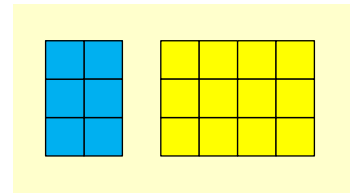
i.



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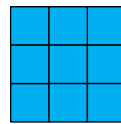
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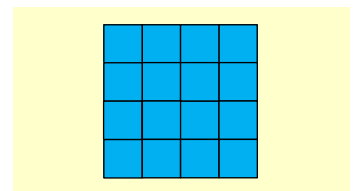
i.



ii.



iii.



iv.