

Independent and Dependent Variables Notes

Independent variable ~ is a variable in an equation where its values can be any number.

- Any value can be chosen for x
- Independent variables change.
- Also known as "Input".

Example: $y = 4x + 2$ ----- x is the **independent variable** because x can be any value you choose for it.

$$\text{If } x = 2 \text{ then } y = 4 \cdot 2 + 2 \quad \text{so } y = 10$$

$$\text{If } x = 4 \text{ then } y = 4 \cdot 4 + 2 \quad \text{so } y = 18$$

These values of input create values of output. Together they are called an order pair: (2, 10), (4, 18). These order pairs are points that are on the same line.

Dependent variable ~ is a variable whose value depends on the other variable. (It depends on the independent variable)

$$\text{Example: } y = 2x + 8$$

- The "y" is dependent because it depends on the number chosen for x .
- You cannot figure out "y" until you know what "x" is.
- Also known as "Output".

*******Bottom line is that the solutions for the equation (Which is the "y") depends on the chosen value for x.**

Example: This type of table is called a **Function Table** or an **Input/Output Table**.

What you get out (y) depends on what you put in (x).

Equation	Input (x)	Output (y)	Order Pair (x, y)
$y = 3x + 2$	4	$3 \cdot 4 + 2 = 14$	(4, 14)
$y = 3x + 2$	0	$3 \cdot 0 + 2 = 2$	(0, 2)
$y = 5x$	1	$5 \cdot 1 = 5$	(1, 5)
$y = 5x$	0	$5 \cdot 0 = 0$	(0, 0)

Replace x with what number it says

(x, y)



$4 \times 2 + 5 = 13$
 $4 \times 0 + 5 = 5$
 $9 \times 2 = 18$
 $9 \times 0 = 0$

Practice: 1

Equation	Input (x)	Output (y)	Order Pair ()
$y = 4x + 5$	2	13	(2, 13)
$y = 4x + 5$	0	5	(0, 5)
$y = 9x$	2	18	(2, 18)
$y = 9x$	0	0	(0, 0)

$20 + 6$
 $0 + 6$
 2×10
 2×0

Practice: 2

Equation	Input (x)	Output (y)	Order Pair ()
$y = x + 6$	20	26	(20, 26)
$y = x + 6$	0	6	(0, 6)
$y = 2x$	10	20	(10, 20)
$y = 2x$	0	0	(0, 0)

$6 \times 4 + 1 = 25$
 $6 \times 0 + 1 = 1$
 8×2
 8×0

Practice: 3

Equation	Input (m)	Output (n)	Order Pair ()
$n = 6m + 1$	4	25	(4, 25)
$n = 6m + 1$	0	1	(0, 1)
$n = 8m$	2	16	(2, 16)
$n = 8m$	0	0	(0, 0)

$2 \times 2 + 2$
 $2 \times 0 + 2$
 $b = 3$
 $b = 0$

Practice: 4

Equation	Input (a)	Output (b)	Order Pair ()
$b = 2a + 2$	2	6	(2, 6)
$b = 2a + 2$	0	2	(0, 2)
$b = a$	3	3	(3, 3)
$b = a$	0	0	(0, 0)

Practice: 5

$7 \times 3 + 1$
 $7 \times 0 + 1$
 5×7
 5×0

Equation	Input (x)	Output (y)	Order Pair ()
$y = 7x + 1$	3	22	(3, 22)
$y = 7x + 1$	0	1	(0, 1)
$y = 5x$	7	35	(7, 35)
$y = 5x$	0	0	(0, 0)

Practice: 6

$2 \times 11 + 10$
 $2 \times 0 + 10$
 11×3
 11×0

Equation	Input (g)	Output (h)	Order Pair ()
$h = 2g + 10$	11	32	(11, 32)
$h = 2g + 10$	0	10	(0, 10)
$h = 11g$	3	33	(3, 33)
$h = 11g$	0	0	(0, 0)

Practice: 7

$4 + 8$
 $0 + 8$
 6×9
 6×0

Equation	Input (p)	Output (q)	Order Pair ()
$q = p + 8$	4	12	(4, 12)
$q = p + 8$	0	8	(0, 8)
$q = 6p$	9	54	(9, 54)
$q = 6p$	0	0	(0, 0)

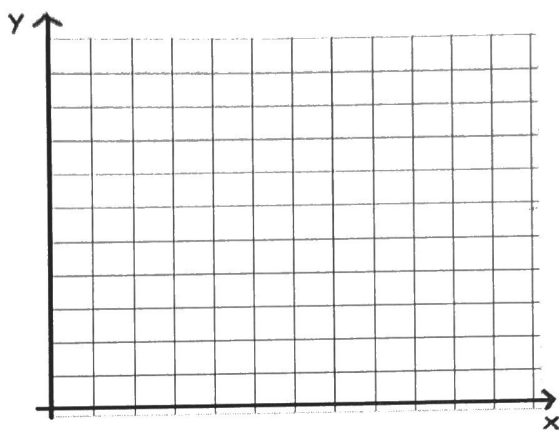
Practice: 8

$45 + 8$
 $3 \times 15 + 8$
 $3 \times 0 + 8$
 8×2
 8×0

Equation	Input (x)	Output (y)	Order Pair ()
$y = 3x + 8$	15	53	(15, 53)
$y = 3x + 8$	0	8	(0, 8)
$y = 8x$	2	16	(2, 16)
$y = 8x$	0	0	(0, 0)

Equation: $y = \frac{x}{2} - 1$

Input (x)	2	4	8	10
Output (y)				
Order Pair				



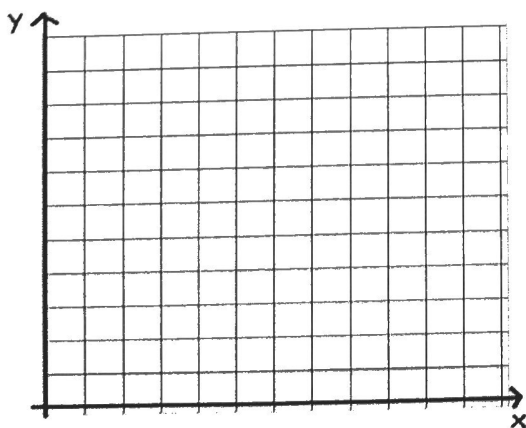
plug in what x is

Equation: $y = 3x + 1$

$3 \times 1 + 1$
 $3 + 1$
 4

$3 \times 0 + 1$
 $0 + 1$
 1

Input (x)	0	1	2	3
Output (y)	1	4	7	10
Order Pair	(0, 1)	(1, 4)	(2, 7)	(3, 10)



$3 \times 2 + 1$
 $6 + 1$
 7

$3 \times 3 + 1$
 $9 + 1$
 10

1. Let "b" represent the boys and "g" represent the girls. Write an equation that shows a relationship between the boys and girls.

$$b = \frac{3}{4}g$$

Answer the questions then graph the order pairs.

There are 2 red blocks for every 4 blue blocks.

- How many red blocks are there if there are 8 blue blocks?
- How many blue blocks are there if there are 6 red blocks?
- How many blue blocks are there if there are 8 red blocks?
- How many red blocks are there if there are 20 blue blocks?

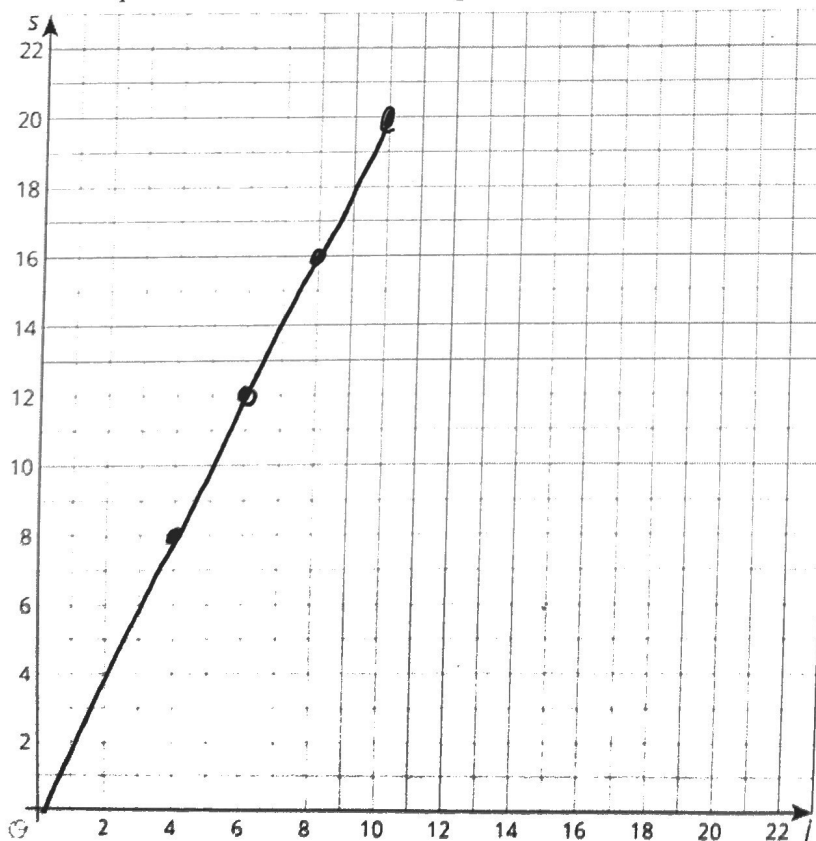
Giving information

Question #	red	blue
Giving	2	4
1	4	8
2	6	12
3	8	16
4	10	20

Complete Table

Red	blue	Order Pair

Plot the points. Do not connect the points.



red (r)

(→, ↑)

→
Draw a table

Red	Blue
2	4
4	8
6	12

Annotations: $\times 2$ (from 2 to 4), $\div 2$ (from 8 to 4), $\times 2$ (from 6 to 12)

blue (b)

R	B
8	16
10	20

Annotations: $\times 2$ (from 8 to 16), $\div 2$ (from 20 to 10)