

2-VARIABLE EQUATIONS

DEF

2-VARIABLE EQUATIONS RELATE AN INDEPENDENT VARIABLE TO A DEPENDENT VARIABLE.

DEF

INDEPENDENT VARIABLE - THE VALUE THAT CAN BE "CONTROLLED"; DRIVES THE SITUATION (INPUT - X)

DEF

DEPENDENT VARIABLE - THE VALUE THAT "DEPENDS" ON THE INDEPENDENT VARIABLE (OUTPUT - Y)

GRAPHING 2-VARIABLE EQUATIONS

ALEX GOT 2 MORE JDLLY RANCHERS THAN CHRIS

$$Y = X + 2$$

X = CHRIS JR
Y = ALEX JR

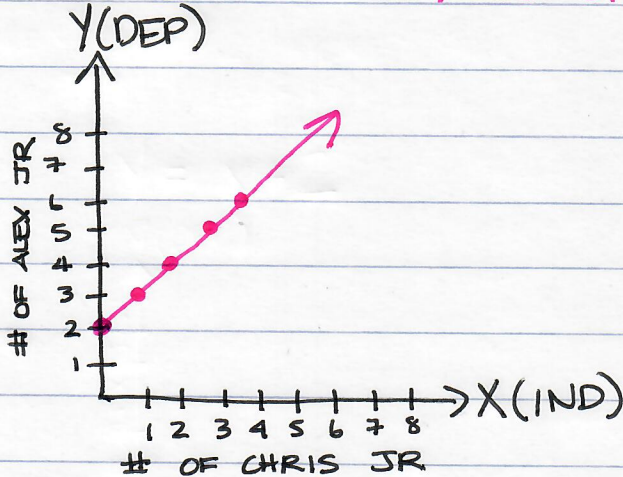


TABLE OF VALUES	CHRIS	ALEX	
	\rightarrow X	\uparrow Y	$\rightarrow \uparrow$
	0	2	(0, 2)
	1	3	(1, 3)
	2	4	(2, 4)
	3	5	(3, 5)
	4	6	(4, 6)

ANNA READ TWICE AS MANY BOOKS AS JOHN

$$Y = 2X$$

X = JOHN'S BOOKS
Y = ANNA'S BOOKS

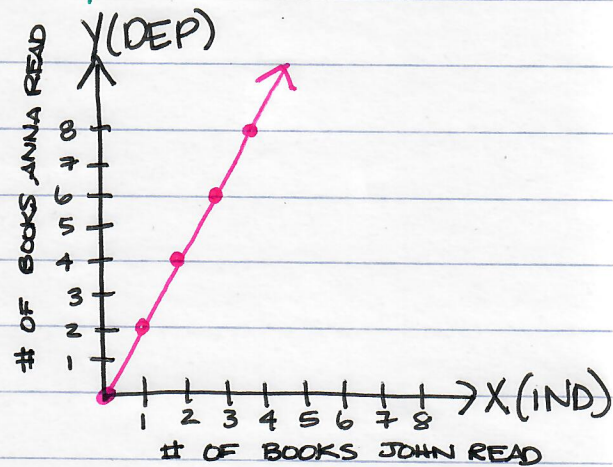


TABLE OF VALUES	JOHN	ANNA	
	\rightarrow X	\uparrow Y	$\rightarrow \uparrow$
	0	0	(0, 0)
	1	2	(1, 2)
	2	4	(2, 4)
	3	6	(3, 6)
	4	8	(4, 8)

DIRECT VARIATION

DEF.

DIRECT VARIATION - RELATES TWO QUANTITIES USING A CONSTANT OF VARIATION; REPRESENTS A PROPORTIONAL RELATIONSHIP (X/: RELATIONSHIP)

DEF.

CONSTANT OF VARIATION (PROPORTIONALITY) = $\frac{y}{x}$
RELATES INPUT + OUTPUT (UNIT RATE)

CONSTANT OF VARIATION

DEPENDENT VARIABLE $\rightarrow y = kx \leftarrow$ INDEPENDENT VARIABLE

$k \neq 0$

USING A DIRECT VARIATION EQUATION IN A TABLE

1) $y = 9x$

IND	x	0	2	3	5	8
DEP	y	0	18	27	45	72

2) $y = 12x$

IND	x	0	4	6	10	12
DEP	y	0	48	72	120	144

3) $y = 1.25x$

IND	x	0	2	4	6	8
DEP	y	0	2.5	5	7.5	10

ADDITION/SUBTRACTION RELATIONSHIP TO TABLE

1) $y = x + 7$

IND	x	0	1	2	5	10	20
DEP	y	7	8	10	12	17	27

2) $y = x - 4$

IND	x	8	19	20	24	100	204
DEP	y	4	15	16	28	96	200

DIRECT VARIATION EQUATION FROM A TABLE (x/÷)

1)

IND	X	0 $\times 5$	1 $\times 5$	2 $\times 5$	3 $\times 5$	4 $\times 5$
DEP	Y	0	5	10	15	20

CONST. OF VAR.
 $K=5$ ←
 $Y=5X$

2)

IND	X	0 $\times \frac{1}{2}$	2 $\times \frac{1}{2}$	4 $\times \frac{1}{2}$	6 $\times \frac{1}{2}$	10 $\times \frac{1}{2}$
DEP	Y	0	1	2	3	5

$K=\frac{1}{2}$
 $Y=\frac{1}{2}X$

*DIRECT VARIATION ALWAYS STARTS AT (0,0)

ADD/SUB RELATIONSHIP EQUATION FROM A TABLE (+/-)

1)

IND	X	0 $+1$	1 $+1$	2 $+1$	3 $+1$	4 $+1$
DEP	Y	1	2	3	4	5

$Y=X+1$

2)

IND	X	2 -2	3 -2	4 -2	5 -2	6 -2
DEP	Y	0	1	2	3	4

$Y=X-2$

EXAMPLE:

BOZO PERFORMS IN 10 CIRCUS ACTS PER DAY.

CONSTANT: 10 = NUMBER OF ACTS PER DAY

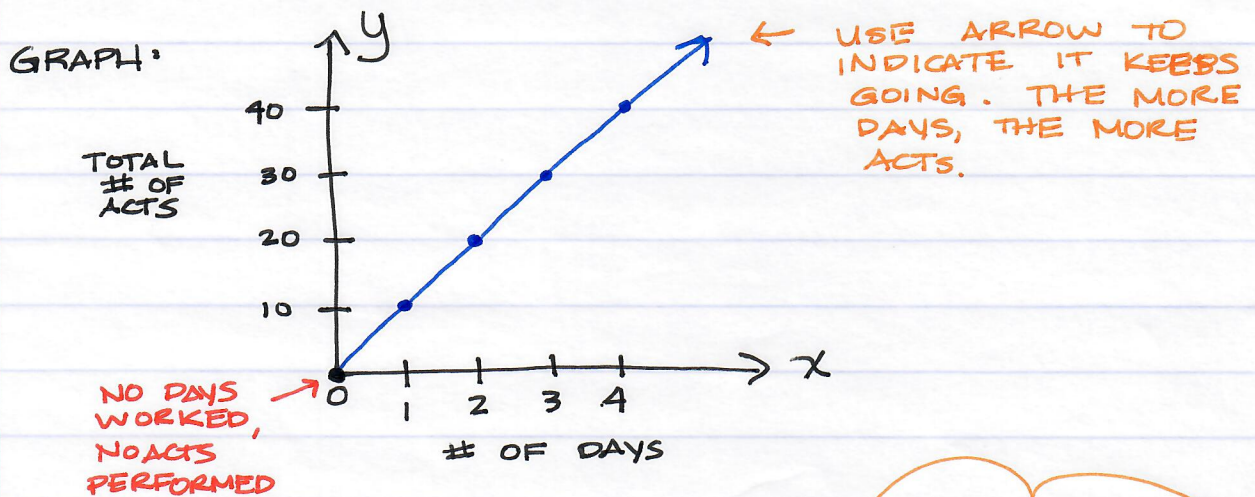
IND. VAR: X = # OF DAYS HE PERFORMS

DEP. VAR: Y = TOTAL # OF ACTS PERFORMED

$$\text{EQUATION: } Y = 10X$$

TABLE OF VALUES

<u>IND.</u>	DAYS (X)	X	0	1	2	3	4
<u>DEP.</u>	TOTAL ACTS (Y)	Y	0	10	20	30	40



$$Y = 10X$$

ORDERED PAIRS →

(x, y)
 $(0, 0)$
 $(1, 10)$
 $(2, 20)$
 $(3, 30)$
 $(4, 40)$

* ALWAYS START AT $(0, 0)$

* ALWAYS A STRAIGHT LINE