DIRECT VARIATION

def

* A DIRECT VARIATION EQUATION IS USED TO RELATE TWO QUANTITIES USING A CONSTANT OF VARIATION, TO DESCRIBE A PROPORTIONAL RELATIONSHIP

$$y = kx$$

- y: DEPENDENT VARIABLE
- k: CONSTANT OF VARIATION
- x: INDEPENDENT VARIABLE

$$k \neq 0$$

def

INDEPENDENT VARIABLE: THE VALUE THAT CAN BE CONTROLLED. (INPUT — x)

DEPENDENT VARIABLE: THE VALUE THAT "DEPENDS" ON THE INDEPENDENT VARIABLE (OUTPUT — y)

def

CONSTANT OF VARIATION (PROPORTIONALITY) = $\frac{y}{x}$

THE CONSTANT THAT RELATES INPUT AND OUTPUT AKA: UNIT RATE

EXAMPLE:

BOZO PERFORMS IN 10 CIRCUS ACTS PER DAY.

CONSTANT: 10 = NUMBER OF ACTS PER DAY

IND. VAR: X = NUMBER OF DAYS WORKING

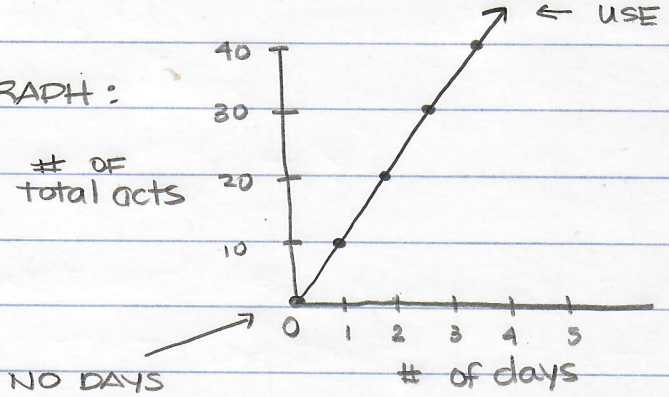
DEP. VAR: Y = TOTAL NUMBER OF ACTS PERFORMED

EQUATION: $Y = 10X$

TABLE OF VALUES (START AT ZERO ZERO)

DAYS	X	0	1	2	3	4
TOTAL ACTS	Y	0	10	20	30	40

GRAPH:



← USE ARROW TO INDICATE IT KEEPS GOING

THE MORE DAYS HE WORKS, THE MORE ACTS HE PERFORMS

NO DAYS WORKED, NO ACTS PERFORMED

YOU TRY:

THERE ARE 8 OUNCES PER CUP

CONSTANT: 8 = OUNCES PER CUP

IND. VAR: X = # OF CUPS

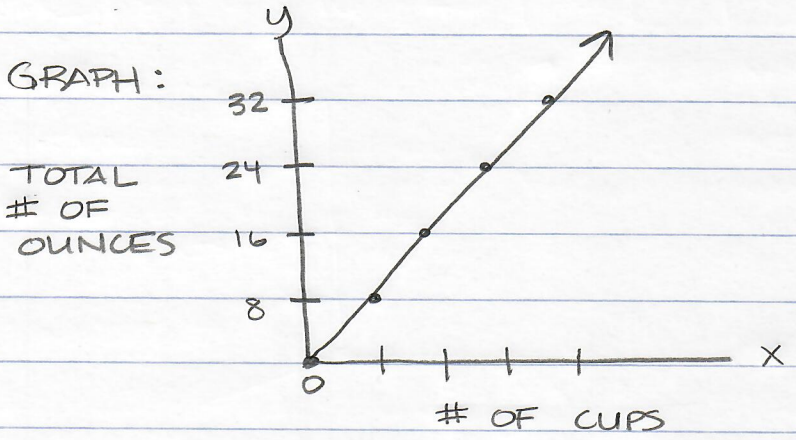
DEP. VAR: Y = TOTAL # OF OUNCES

$$Y = KX \quad = \quad \text{TOTAL OZ.} = \overset{(10)}{\text{OZ}}/\text{CUP} \cdot \#\text{ OF CUPS}$$

TABLE OF VALUES

# OF CUPS	0	1	2	3	4
TOTAL OUNCES	0	8	16	24	32

GRAPH:



IF GIVEN A DIRECT VARIATION EQUATION, YOU CAN MAKE A TABLE OF VALUES.

1) $y = 9x$

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

2) $y = 12x$

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

3) $y = 1.25x$

x	0	2	4	6	8
y	1.25	2.5	5	7.5	10

YOU CAN CREATE A DIRECT VARIATION EQUATION FROM A TABLE.

1)

x	0	1	2	3	4
y	0	5	10	15	20

(×5 between each pair; ×5)

$K = 5$

$y = 5x$

2)

x	2	4	6	10	20
y	1	2	3	5	10

(×1/2 between each pair; ×1/2)

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

$y = \frac{1}{2}x$

MSG pgs. 21 b, 22a, 23ab