Writing Function Rules key

Functions can be represented as tables, graphs, equations, physical models, or in words.

Example 1: Tim's salary as a lifeguard depends on the number of hours he works. If he is paid $9.00 an hour, what is his salary for 3 hours? 12 hours? 22 hours?

Is his salary a function of the number of hours he works? Explain. yes because the amt he is paid in total depends on the # hours he works

If possible, write the rule. Then, create a table of values.

Words: salary = ($9/hr)(# hours)

Equation: $f(x) = 9x$

Input	Rule	Output
3	9(3)	27
12	9(12)	108
22	9(22)	198

Example 2: The distance that Missy rides her bike depends on the number of minutes that she spends riding her bike. If she rides her bike at a constant rate of 0.15 miles per minute, what distance does Missy ride her bike in 15 minutes? 30 minutes? 1 hour?

Is the distance she rides her bike a function of the number of minutes she bikes? Explain. yes her distance depends on # min she's been riding

If possible, write the rule. Then, create a table of values.

Words: distance = (0.15mi/min)(# min)

Equation: $D = 0.15m$

Input	Rule	Output
15	0.15(15)	2.25 mi
30	0.15(30)	4.5 mi
60	0.15(60)	9 mi

Inr = $\frac{\text{mi}}{\text{min}}$

Example 3: Is the cost a function of the number of donuts? Explain. yes. overall cost depends

Input (number of donuts)	1	2	3	4	5
Output (cost of the donuts)	$1.25	$2.50	$3.75	$5.00	$6.25

If possible, write the rule.

Words: cost of donuts = ($1.25/donut)(# donuts)

Equation: $C = 1.25d$

Example 4: In the absence of predators, the number of deer in a forest increases over time. Is the number of deer a function of the number of years? Explain

yes - each year the # of deer increases by 4/3 times the previous year.

Input (year)	Output (# of deer)
1	27
2	36
3	48
4	64

$\times \frac{4}{3}$ $\times 4/3$ $\times 4/3$

If possible, write the rule. rate of increase

Words: # of deer = $\frac{4}{3}$ x # deer from previous year

Equation: $y = 27\left(\frac{4}{3}\right)^{n-1}$ OR $y = 20.25\left(\frac{4}{3}\right)^{n}$

Example 5: The width of a rectangular picture frame must be 1.5 times as long as the length. Is the Area of the frame a function of the length? Explain

yes - area depends on length & width. width is dependent on length, therefore the area is too.

Input (length)	Output (Area)
4	24
8	96
10	150
12	216

$w = 1.5\ell$

$A = \ell w$

$A = \ell(1.5\ell)$

$A = 1.5\ell^2$

If possible, write the rule.

Words: area = length x width

Equation: $A = 1.5\ell^2$

Example 6: Is the relationship a function? Explain. If possible, write the function rule.

a.

Input	0	2	4	6	8
Output	3	13	23	33	43

+2 +2 +2 +2

+10 +10 +10 +10

with each increase of 2 in the input, the output increases by 10.

b.

Input	0	1	2	3	4
Output	400	320	256	204.8	163.84

$\times \frac{4}{5}$ $\times \frac{4}{5}$ $\times \frac{4}{5}$ $\times \frac{4}{5}$

as the input increases by 1, the output increases by a factor of 4/5