4-3 Write Function Rules

Name _____ Date _____

Write a function rule for the total cost of $200 plus $15 per hour.

Let h represent number of hours. ← independent variable
Let c represent total cost. ← dependent variable (varies with hours)
You know: total cost = basic fee + hourly charges
$c = 200 + 15h$ ← function rule relating h and c

Because c depends on h, c is a function of h.
$c(h) = 200 + 15h$ ← function rule in function notation

Identify the independent and dependent variables in each situation. Then use function notation to express each relationship.

1. The larger a drain, the faster water empties from a tank.

ℓ: the size of the drain (independent variable)
w: the water that empties (dependent variable)
$w(\ell)$

2. The bigger a fan blade, the more wind generated.

3. The faster Kyle types, the less time it takes to type a report.

4. The faster Mr. Harris drives, the less time it takes to get home.

Write a function for each situation. Use function notation.

5. the area of a square, A, when you know the length of the side, s

s is the independent variable and A is the dependent variable.
$A = s^2$
$A(s) = s^2$

6. the perimeter of a square, P, when you know the length of the side, s

7. the total cost, c, for h hours at an hourly rate of $12.50 per hour

8. the total cost, c, for h hours at an hourly rate of $25.75 per hour

9. the distance traveled, d, at a speed of s miles per hour for 5 hours

10. the distance traveled, d, for h hours at a speed of 55 miles per hour

Write a rule that expresses the relationship for each pair of input and output values in each table.

11.

x	y
−0.25	−0.375
0	0
1.2	1.8
5.75	8.625

Pattern: −0.25(1.5) = −0.375
0(1.5) = 0
1.2(1.5) = 1.8
5.75(1.5) = 8.625
$y = 1.5x$

12.

a	b
−0.23	0.253
−0.20	0.22
0	0
2.1	−2.31

13.

f	g
−1.15	−0.5
−0.322	−0.14
0	0
6.21	2.7

14.

p	q
−109.3	4.372
0	0
0.525	−0.021
4.450	−0.178

15.

ℓ	m
−1.5	−2
−0.5	0
0	1
1.5	4

16.

q	r
−5.5	24
−1.2	6.8
0	2
2.4	−7.6

17.

x	y
−5	24
−2	3
0	−1
7	48

18.

g	h
−3	−26
0	1
4	65
6	217

19.

m	n
−5	6.25
0	0
3	2.25
11	30.25

Solve.

20. Harriet pays $35.99 per month and $0.75 per text message for her cell phone. What rule, in function notation, models Harriet's total monthly cost, c, if she writes t text messages?

21. Denise pays $350 for seed and $3.50 per acre for fuel to plant a field. What rule, in function notation, models Denise's total cost, c, to plant a acres?

CRITICAL THINKING

22. Write a rule that expresses the relationship for each pair of x- and y-values in the table.

x	−3	−2	−1	0	1	2
y	26	7	0	−1	0	7