Warm Up Grade 7

Monday, Oct. 23

1) Fred's Car Rental charges $50 for a car plus $2 per kilometer.

constant

a) Write a relation for the cost of renting a car, in dollars, for n kilometers

n = amount of km

$$Cost = 2n + 50$$

b) Complete a chart to relate Kilometer to total cost.

Kilometer, n	1	2	3	4	5	6
Cost $	52	54	56	58	60	62

up 2 up 2

n = 1

$C = 2n + 50$

$2(1) + 50$

$2 + 50$

52

n = 2

$2(2) + 50$

$4 + 50$

54

n = 3

$2(3) + 50$

$6 + 50$

56

Key words

For each
For every
per
/

} This number goes infront of variable

$5 each → 5x
5n
5p

Practice

1. Each table shows the input and output from a machine with one operation. For each table:
   - Identify the number and the operation in the machine.
   - Continue the patterns.
     Write the next 4 input and output numbers.
   - Write the pattern rule that relates the input to the output.

a)

Input	Output
1	7
2	14
3	21
4	28

7n

c

5	35
6	42
7	49
8	56

b)

Input	Output
50	39
49	38
48	37
47	36

In - 11

46	35
45	34
44	33
43	32

3 4. Each table shows the input and output from a machine with two operations.

- Find the pattern rule that relates the input to the output.
- Use the pattern rule to find the missing numbers in the table.
- Use the patterns in the columns to check your answers.
- Predict the output when the input is 40. Check your prediction.

a)

Input	Output
5	21
6	24
7	27
8	30
9	33
10	36

b)

Input	Output
0	1
5	2
10	3
?	4
20	5
25	?

3n + 6

Check

n = 5 out = 21

3(5)

15 add 6

n= 40

3(40) + 6

120 + 6

126

4

a) Write a pattern rule that relates the input to the output.

b) Predict the output when the input is 9. Extend your pictures to check.

c) Which input has an output of 28? Describe the strategy you used to find out.

Input	Output
1	6
2	8
3	10
4	12

+2 +2 +2

a) $2n + 4$

Check $n = 1 \Rightarrow$ out = 6

$2n$

$2(1)$

2

add 4

b) $n = 9$

$2n + 4$

$2(9) + 4$

$18 + 4$

22

c) $28 = 2n + 4$

$28 = 24 + 4$

$2(12)$

$n = 12$

5) Write the pattern rule that relates the input to the output

a)

Input	Output
1	15
2	19
3	23
4	27

+4 +4 +4

$4n + 11$

Check $4(1)$

4

out is

add 11

b)

Input	Output
1	4
2	10
3	16
4	22

+6 +6 +6

$6n - 2$

Check $n = 1$ out = 4

$6(1)$

6

Subtract 2

Q23

Homework

Solutions

1. i) For each number pattern, how is each term related to the term number?
ii) Let n represent any term number. Write a relation for the term.

a)

Term Number	1	2	3	4	5	6
Term	2	4	6	8	10	12

b)

Term Number	1	2	3	4	5	6
Term	3	4	5	6	7	8

c)

Term Number	1	2	3	4	5	6
Term	8	16	24	32	40	48

d)

Term Number	1	2	3	4	5	6
Term	6	7	8	9	10	11

a) The term is double the term number
Term = 2n or 2×n

b) The term is 2 added the term number
Term = n + 2

c) The term is 8 times the term number
Term = 8n or 8×n

d) The term is 5 more than the term number
Term = n + 5 or 5 + n

Homework
Solutions

2. There are n students in a class. Write a relation for each statement.

a) the total number of pencils, if each student has three pencils
b) the total number of desks, if there are two more desks than students
c) the total number of geoboards, if each pair of students shares one geoboard
d) the total number of stickers, if each student gets four stickers and there are ten stickers left over

a)

# of students	1	2	3	4	n
# of pencils	3	6	9	12	3n
	1x3	2x3	3x3	4x3	nx3

b)

# of students	1	2	3	4	n
# of desks	3	4	5	6	n+2
	1+2	2+2	3+2		

c)

# of students	2	4	6	8	n
# of geoboards	1	2	3	4	$\frac{n}{2}$
	$\frac{2}{2}$	$\frac{4}{2}$	$\frac{6}{2}$	$\frac{8}{2}$	

d)

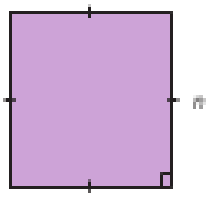
# of student	1	2	3	4	n
# of stickers	14	18	22	26	nx4+10 or 4n+10
	1x4+10	2x4+10	3x4+10	4x4+10	

4. a) Write a relation for the perimeter of a square with side length n centimetres.

b) What is the perimeter of a square with side length 12 cm?

c) Suggest a situation that could be represented by each relation.

i) $3s$ is related to s ii) $8t$ is related to t



a) Perimeter = $n+n+n+n$
or $4n$

b) $4n$, $n=12$
4×12
48

c) Perimeter of Equilateral Triangle $3s$
Perimeter of Regular Octagon with each side being t $8t$

Section 1.4

More Examples

Day 2

For each number pattern, how is each term related to the term number

a)

Term number	1	2	3	4	5	...	n
Term	5	10	15	20	25	...	_____

up 1, up 5 → 5n

Check n = 1: 5n, 5(1), 5 — same ✓ out = 5

b)

Term number	1	2	3	4	5	...	n
Term	9	13	17	21	25	...	4n+5

up 1, up 4 → 4n

Check n = 1: 4(n), 4(1), 4 — add 5 out = 9

c)

Term number	1	2	3	4	5	...	n
Term	7	12	17	22	27	...	5n+2

up 1, up 5 → 5n

Check n = 1 out = 7: 5n, 5(1), 5 — add 2

1) Karen wants to attend a fair. The cost enter the fair ground is $10. While at the fair the tickets for the rides cost $2 each.

a) In a chart show how the total cost is related to the number of rides.

tickets, n	0	1	2	3	4	...	n
Cost	10	12	14	16	18	...	2n+10

b) How much is the fair if she goes on 20 rides?

$C = 2n + 10$

$2(20) + 10$

$40 + 10 = 50$

It will cost $50 to go on 20 rides

c) Suppose the cost of the entrance fee doubles. Write a relation for the total cost of the fair for n number of rides.

$C = 2n + 10$

$2n$: rides; 10: get in fair → double entrance

$C = 2n + 20$

Class/Homework

use key words

(6b, a, c, d, e)

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#6(a,b,c,d,e),

#7(a,b,c,d,e),

#9(a,b,c both i & ii)

6b) $20 $9 per person each

6b: 9p + 20

6a) p = 5

9p + 20
9(5) + 20
45 + 20
65

p = 10

9p + 20
9(10) + 20
90 + 20
110

c) 9p + 20

9p: food → double

+20: campsite

18p + 20

d) 9p + 20

9p: food

+20: campsite → double

9p + 40

e) Use p because people starts with p