

## Warm Up Grade 7

Wednesday, Oct. 26



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

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

$$\text{Cost} = 2n + 50$$

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

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

$$\begin{array}{r} \swarrow \\ 2(1) + 50 \\ 2 \quad + 50 \\ 52 \end{array}$$

**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. 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	?
25	?

$$3n + 6$$

Check

$$n = 5 \quad \text{out} = 21$$

$$3(5)$$

$$15$$

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

b)  $n=9$   
 $2n+4$   
 $2(9)+4$   
 $18+4$   
 $22$

c)  $28=2n+4$   
 $28=24+4$   
 $2(12)$   
 $n=12$

a)  $2n+4$   
 Check  
 $n=1 \Rightarrow \text{out}=6$   
 $2n$   
 $2(1)$   
 $2$  → add 4

Write the pattern rule that relates the input to the output

5) a)

Input	Output
1	15
2	19
3	23
4	27

$4n+11$   
 Check  
 $4(1)$   
 $4$  → add 11  
 out 15

b)

Input	Output
1	4
2	10
3	16
4	22

$6n-2$   
 Check  
 $n=1$  out 4  
 $6(1)$   
 $6$  → subtract 2

Q23

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.

Homework

Solutions

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  $2 \times n$

b) The term is 2 added to the <sup>term</sup> number  
 $Term = n + 2$

c) The term is 8 times the <sup>term</sup> number  
 $Term = 8n$  or  $8 \times n$

d) The term is 5 more than the <sup>term</sup> number  
 $Term = n + 5$  or  $5 + n$

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

Homework

a) the total number of pencils, if each student has three pencils

Solutions

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

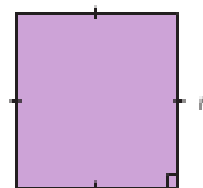
a) # of students	1	2	3	4	$n$
# of pencils	3	6	9	12	$3n$
	$1 \times 3$	$2 \times 3$	$3 \times 3$	$4 \times 3$	$n \times 3$

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	$n \times 4 + 10$
	$1 \times 4 + 10$	$2 \times 4 + 10$	$3 \times 4 + 10$	$4 \times 4 + 10$	$4n + 10$ or $4n + 10$

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  $t$



$$a) \text{ Perimeter} = n + n + n + n \\ \text{or } 4n$$

$$b) \quad 4n, n=12 \\ 4 \times 12 \\ 48$$

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	...	$5n$

*Handwritten notes:*  
 An arrow points from the term number 1 to the term 5 with the label "up 1".  
 Another arrow points from the term number 2 to the term 10 with the label "up 5".  
 Below the table, it says "check  $5(1)$ " with a checkmark.

b)

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

*Handwritten notes:*  
 The term 9 is circled. An arrow points from the term number 1 to the circled 9 with the label "4n" and "4(1)".  
 Another arrow points from the term number 2 to the term 13 with the label "out 9" and "add 5".

c)

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

*Handwritten notes:*  
 The term 7 is circled. An arrow points from the term number 1 to the circled 7. Below this, it says "5n+2", "5(1)", and "5+2 => 7".



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



$n \equiv \# \text{ of rides}$

$$2n + 10$$

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

# of rides	0	1	2	3	4	...	n
Total Cost	10	12	14	16	18	...	$2n + 10$

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

$$\begin{aligned} \text{Cost} &= 2n + 10 \\ C &= 2(20) + 10 \\ C &= 40 + 10 \\ C &= 50 \end{aligned}$$

It will cost a total of \$50 to go on 20 rides at the fair.

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

Original

$$C = 2n + 10$$

↓ double

$$C = 2n + 20$$

New Cost

Class/Homework

~~Page~~

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

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

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

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

$$9n + 20$$

a)  $n = 5$

$$9(5) + 20$$

$n = 10$

$$9(10) + 20$$

b) Cost =  $9p + 20$