

Class work solutions

Sheet 13

Name: _____

Grade 7 Unit 1: Patterns & Relations

Sheet 13

1) For each of the following charts,

i) Fill in the missing numbers.

ii) Write the relations as an algebraic expression

iii) Describe the relation in words (Term = ___ times term # Plus or Minus Constant)

a) **As term # increases by 1, the term increases by 3**

Term Number	1	2	3	4	5	6
Term	10	13	16	19	22	25

$3n + 7$ check $n=1$ $3(1) + 7 = 10$ out = 10 add 7

b)

Term Number	1	2	3	4	5	6
Term	10	11	12	13	14	15

check $n=1$ $1(1) + 9 = 10$ out = 10 add 9

c)

Term Number	1	2	3	4	5	6
Term	3	7	11	15	19	23

$4n - 1$ check $n=1$ $4(1) - 1 = 3$ out = 3 subtract 1

d)

Term Number	1	2	3	4	5	6
Term	7	13	19	25	31	37

$6n + 1$

e)

Term Number	1	2	3	4	5	6
Term	10	20	30	40	50	60

$10n$ $10(1) = 10$ ✓

2) a) For Part 1d) find the value of the 15th term. (Use algebraic expression and a calculator to get answer)

$6n + 1$
 $6(15) + 1 = 91$

b) For part 1e) find the value for the 12th term. (Use algebraic expression to get answer)

$10n$
 $10(12) = 120$

3) Kevin is planning a wedding and the cost to rent the hall is \$250. The cost of food is \$20 per person.

a. Complete a chart of Kevin's total cost related to number of people for the first 6 people.

People (n)	1	2	3	4	5	6
Cost	270	290	310	330	350	370

20×250 } $2(20) + 250 = 290$ } $3(20) + 250 = 310$
 270 } $40 + 250 = 290$ } $60 + 250 = 310$

b. Write the algebraic relation of total cost to # of people using "p" as the variable.

$Cost = 20p + 250$

c. Explain the relation in words.

As the # of people increases by 1, the cost increases by \$20.

4) a) Write the perimeter of a regular octagon as an algebraic expression if each side has a length of "n".



b) Find the perimeter if the length of the side of the regular octagon is 6 cm.

$P = 8(6\text{cm})$
 $P = 48\text{cm}$

5) Ted is having a party. The cost to rent the hall is \$25 and the cost for food is \$10 per person.

a. Create a chart that relates the number people to the total cost.

# of people (p)	1	2	3	4	5	6
Total Cost	35	45	55	65	75	85

1 person: $10 + 25 = 35$
 2 people: $2(10) + 25 = 45$
 3 people: $3(10) + 25 = 55$
 4 people: $4(10) + 25 = 65$
 5 people: $5(10) + 25 = 75$
 6 people: $6(10) + 25 = 85$

b. Write out the relations as an algebraic expression.

$10p + 25$

c. Write the relation in words.

As the # of people increases by 1, the cost increases by \$10.

d. What is the total cost when 90 people are invited? (Show work)

$10(90) + 25 = 925$ is the cost to invite 90 people.

e. What is the total cost when 25 people are invited? (Show work)

$10(25) + 25 = 275$ to invite 25 people

f. What is the new expression if the cost of food doubles?

$20p + 25$

6) SIMPLIFY then evaluate each of the following: (MUST COLLECT LIKE TERMS FIRST)

a) $4t + 7p - 2p - 6t - t + 5$; $p = 2$ & $t = 7$

$4t + 6t - t + 7p - 2p + 5$
 $9t + 5p + 5$
 $9(7) + 5(2) + 5 = 63 + 10 + 5 = 78$

b) $5ab + 6b - 10 + 6b$; $a = 2$ & $b = 5$

$5ab + 6b + 6b - 10$
 $5ab + 12b - 10$
 $5(2)(5) + 12(5) - 10 = 50 + 60 - 10 = 100$

c) $5r + 6w + 7r + 2w - 4r$; $r = 3$ & $w = 2$

$5r + 7r - 4r + 6w + 2w$
 $8r + 8w$
 $8(3) + 8(2) = 24 + 16 = 40$

7) Write an algebraic expression for each of the following. (Remember to define your letter for the variable)

a) Product of 14 and a number.

means multiply $14n$

let $n =$ a number

b) A number subtract from 26

$26 - n$

c) A number increased by 3

$n + 3$

d) Triple a number plus 21

$3n + 21$

e) A number reduced by 8

$n - 8$

f) 31 subtract a number

$31 - n$

8) Write the expression as words

a. $d - 11$

a number minus 11

b. $100 - b$

100 subtract a number or a number subtracted from 100.

c. $3n + 6$

triple a number increased by 6.

a)

Input f	Output f + 14
1	15
2	16
3	17
4	18
5	19

$$\left. \begin{array}{l} f=1 \\ (1)+14 \end{array} \right\} \left. \begin{array}{l} f=2 \\ (2)+14 \end{array} \right\}$$

9b)

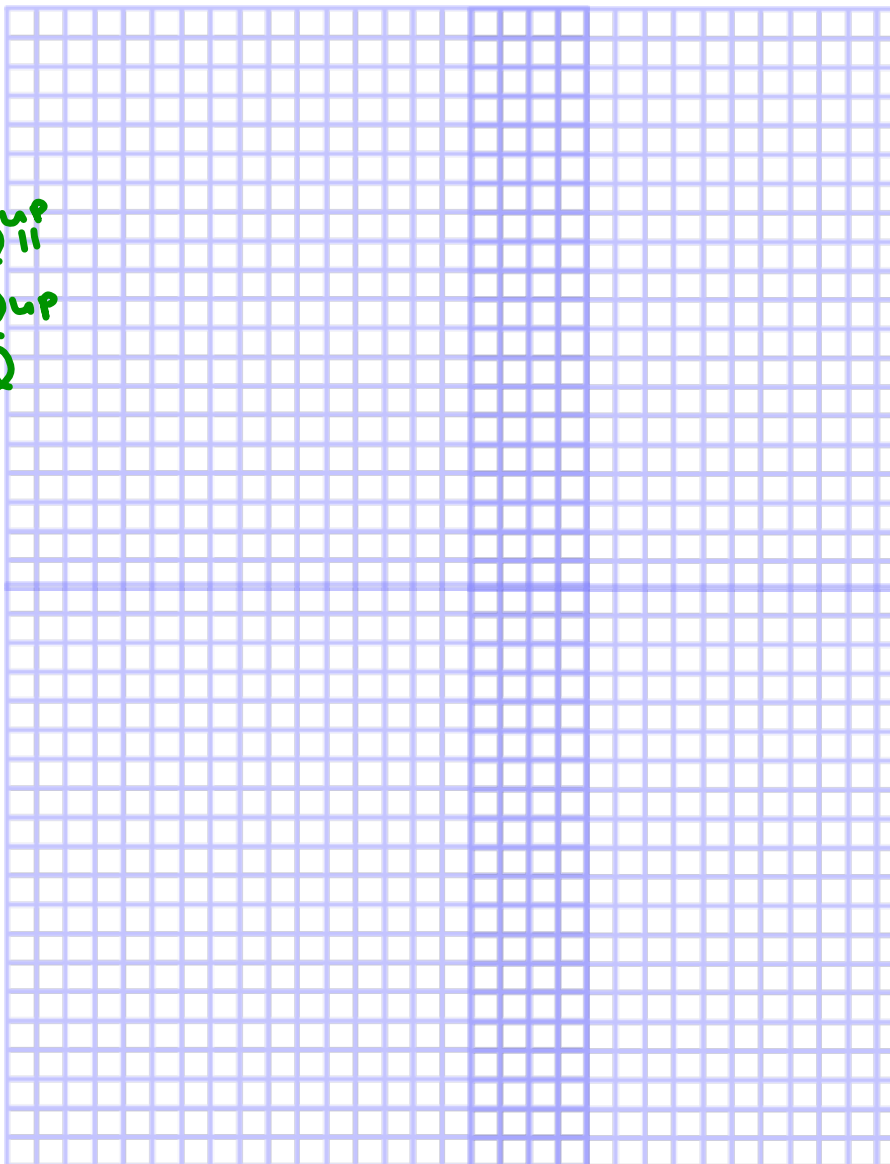
$$\begin{array}{r} 11(1)-1 \\ 11-1 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 11(2)-1 \\ 22-1 \\ \hline 21 \end{array}$$

$$\begin{array}{r} 11(3)-1 \\ 33-1 \\ \hline 32 \end{array}$$

Input k	Output $11k - 1$
1	10
2	21
3	32
4	43
5	54

Handwritten green annotations: "up" and "11" with arrows pointing to the output values in the table.



Attachments

Grade 7 Unit 1 Shee 13.docx