

Grade 7 Unit 1: Patterns & Relations

Sheet 12

- 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

a)

|             |   |   |    |   |    |   |
|-------------|---|---|----|---|----|---|
| Term Number | 1 | 2 | 3  | 4 | 5  | 6 |
| Term        | 5 |   | 15 |   | 25 |   |

b)

|             |   |   |   |   |   |   |
|-------------|---|---|---|---|---|---|
| Term Number | 1 | 2 | 3 | 4 | 5 | 6 |
| Term        | 5 |   | 7 |   | 9 |   |

c)

|             |   |   |   |   |    |   |
|-------------|---|---|---|---|----|---|
| Term Number | 1 | 2 | 3 | 4 | 5  | 6 |
| Term        | 3 |   | 9 |   | 15 |   |

d)

|             |   |    |    |    |    |    |
|-------------|---|----|----|----|----|----|
| Term Number | 1 | 2  | 3  | 4  | 5  | 6  |
| Term        | 6 | 12 | 18 | 24 | 30 | 36 |

e)

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

- 2) a) For Part 1d) find the value of the 12<sup>th</sup> term. (Use algebraic expression to get answer)

- b) For part 1e) find the value for the 20<sup>th</sup> term. (Use algebraic expression to get answer)

- 3) Jim is walking in a marathon across New Brunswick. His goal is to walk 12 km per day.  
 a. Complete a chart of Jims total distance related to number days for the first 6 days.

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 | 6 |
|  |   |   |   |   |   |   |

- b. Write the relation of days to kilometers as an algebraic expression using “d”.  
 c. Explain the relation in words.

- 4) a) Write the perimeter of the regular pentagon 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 pentagon is 9 cm.

- 5) Ted is having a party. The cost to rent the hall is \$100 and the cost for food is \$8 per person.  
 a. Create a chart that relates the number people to the total cost.

|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 | 6 |
|  |   |   |   |   |   |   |

- b. Write out the relations as an algebraic expression.  
 c. Write the relation in words.  
 d. What is the total cost when 20 people are invited? (Show work)

e. What is the total cost when 50 people are invited? (Show work)

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

g. What is the new expression if the food increases by \$2 per person?

6) **SIMPLIFY** then evaluate each of the following:

a.  $6f + 7k - 4f + 8 - 2f + 10f + 2k$ ,  $k = 3$  &  $f = 10$

b)  $4ab + 6ab - 2 + 6b$ ;  $a = 2$  &  $b = 5$

c)  $11p - 7k + 2p + 10$ ;  $p = 6$  &  $k = 4$

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

a) 18 more than a number.

b) A number subtract 15

c) The product of a number and 7

d) The quotient of a number and 3.

e) 5 more than a tripled number

f) A number subtracted from 56

g) Double a number and subtract 6.

8) Write the expression as words

a.  $15 - n$

b.  $17 + k$

c.  $5n + 6$