Patterns and Relations Review Booklet 2

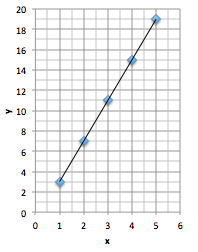
1. Represent and describe patterns and relationships, using graphs and tables.

* Translate a pattern to a table of values, and graph the table of values (limited to linear graphs with discrete elements).
* Create a table of values from a given pattern or a given graph.
* Describe, using everyday language, orally or in writing, the relationship shown on a graph.

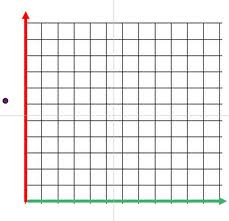
Consider the graph below:

|  |  |
| --- | --- |
| x | y |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. fill in the following table of values from the graph



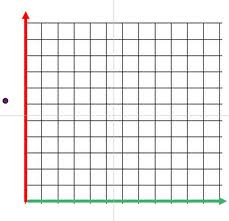
1. From the graph predict the y – value when x = 9
2. From the graph what is the x – value when y = 31

Lisa is filling candy bags for the school carnival, Lisa puts 6 candies in each bag.

1. Complete the following table:

|  |  |
| --- | --- |
| Bags | Candies |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |

1. Graph the data above of the graph provided. Choose an appropriate scale.
2. Write an equation or an expression that shows the relationship between the number of bags and candies.

Consider the data below:

|  |  |
| --- | --- |
| Time (min.) | Temp (°C) |
| 0 | 12 |
| 1 | 14 |
| 2 | 16 |
| 3 | 20 |
| 4 | 18 |
| 5 | 15 |
| 6 | 14 |
| 7 | 12 |
| 8 | 10 |

1. graph the data on the graph above, choose an appropriate scale
2. describe two conclusions that you could make from the graph
3. Demonstrate an understanding of the relationships within tables of values to solve problems.

* Generate values in one column of a table of values, given values in the other column and a pattern rule.
* State, using mathematical language, the relationship in a given table of values.
* Create a concrete or pictorial representation of the relationship shown in a table of values.
* Predict the value of an unknown term, using the relationship in a table of values, and verify the prediction.
* Formulate a rule to describe the relationship between two columns of numbers in a table of values.
* Identify missing elements in a given table of values.
* Identify errors in a given table of values.
* Describe the pattern within each column of a given table of values.
* Create a table of values to record and reveal a pattern to solve a given problem.

Complete the following tables, fill in the missing numbers:

|  |  |
| --- | --- |
| A | B |
| 2 | 14 |
| 3 | 21 |
| 4 |  |
| 8 |  |
|  | 84 |

|  |  |
| --- | --- |
| T-shirts | Cost ($) |
| 4 | 21.00 |
| 5 | 26.25 |
| 6 |  |
| 10 |  |
|  | 73.50 |

1. what is the relationship between t-shirts and cost?
2. What is the relationship between A and B?

Look at the tables below:

* complete the table
* what is the rule used for each table?
* What is the output if the input is 8?
* Write an equation for each table.

a. b.

|  |  |
| --- | --- |
| Input | Output |
| 1 | 7 |
| 2 | 11 |
| 3 | 15 |
| 4 |  |
| 5 |  |
| 10 |  |

|  |  |
| --- | --- |
| Input | Output |
| 1 | 5 |
| 2 | 8 |
| 3 | 11 |
| 4 |  |
| 5 |  |
| 8 |  |

Use the following equations to complete each table:

a. 5n + 2 b. 4n - 1

|  |  |
| --- | --- |
| Input (n) | Output |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 8 |  |

|  |  |
| --- | --- |
| Input (n) | Output |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 10 |  |

1. Represent generalizations arising from number relationships, using equations with letter variables.

* Identify the unknown in a problem where the unknown could have more than one value, and represent the problem with an equation.
* Create a problem for a given equation with one unknown.
* Identify the unknown in a problem; represent the problem with an equation; and solve the problem concretely, pictorially or symbolically.

The following formula can be used to calculate the **A -** area of a rectangle where **b** represents the base of a rectangle:

A = 12 x b

Complete the table using this formula:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| b (base) | 2 | 4 | 6 | 8 | 10 |
| A (area) |  |  |  |  |  |

Peter is buying bottles of pop for his friends each bottle of pop cost $1.75. Complete the following table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Bottles | 2 | 3 | 4 | 5 |
| Cost |  |  |  |  |

Write an equation for this relationship:

Use the following equation to solve the following problem. Dexter uses the following equation to calculate the number of floor tiles needed to cover a floor where:

**n** – number of tiles **A**  - area

A = 8 n

1. What is the area covered by 12 tiles?
2. How many tiles are needed to cover a floor that has an area of 360 cm2?
3. Express a given problem as an equation in which a letter variable is used to represent an unknown number.

* Identify the unknown in a problem where the unknown could have more than one value, and represent the problem with an equation.
* Create a problem for a given equation with one unknown.
* Identify the unknown in a problem; represent the problem with an equation; and solve the problem concretely, pictorially or symbolically.

Use a diagram to illustrate the following problems, then solve the equation:

a.  b. 

Solve the following equations for the unknown variable:

a. 4 n = 12 b. 8 a = 40

c. 3 x = 18 d. 5 y = 35

e.  f. 

g.  h. 

1. Demonstrate and explain the meaning of preservation of equality, concretely and pictorially.

* Model the preservation of equality for addition, using concrete materials (e.g., a balance, pictorial representations), and explain and record the process.
* Model the preservation of equality for subtraction, using concrete materials (e.g., a balance, pictorial representations), and explain and record the process.
* Model the preservation of equality for multiplication, using concrete materials (e.g., a balance, pictorial representations), and explain and record the process.
* Model the preservation of equality for division, using concrete materials (e.g., a balance, pictorial representations), and explain and record the process.

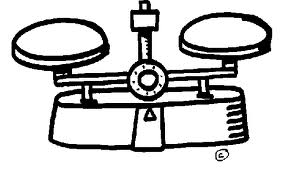
Show that the following expressions are equal:

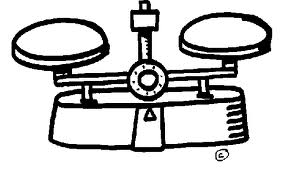
a. 4 + 12 = 12 + 4

b. 8 + 44 = 44 + 8

Solve the following balance questions:

1. what is the weight of 1 triangle?



1. what is the weight of 1 square?

c. what is the weight of 1 square in terms of circles?