**4.2 Partial Variation**

**Minds-On**

Consider a taxi that charges $2 plus fifty cent per kilometre.

|  |  |
| --- | --- |
| Distance (km) | Cost ($) |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |

1. Create a table of values to represent this situation.
2. Graph the situation. How does this graph differ from those discussed in 4.1? Is it a direct variation?
3. Develop an equation to represent this situation. How does the equation differ from those in 4.1?

This has been an example of a **partial variation.**

Partial variation situations have the following properties:

* They can be written in equation form as $y=mx+b$, where $m$ is a rate of change, and *b* is the fixed or initial value
* The graph is a straight line that passes through (or starts) at (0, b)

**Example 1:**

|  |  |
| --- | --- |
| x | y |
| 0 | 6 |
| 1 | 9 |
| 2 |  |
| 3 | 15 |
| 4 |  |
|  | 27 |

1. Complete the table of values given that *y* varies partially with *x*.
2. Write an equation relating *y* and *x* in the form $y=mx+b$.
3. Graph the relation and describe the graph.

**Example 2:**

The prom committee is considering some venues for the prom. One facility charges $675 plus $12 per person for food and non-alcoholic drinks.

1. Identify the fixed and the variable cost of this partial variation.
2. Write an equation to represent the relationship.
3. Use your equation to determine the total cost if 500 people attend the prom.

**Example 3:**

Jon’s Furnace repair charges a service charge $50 per job, plus $40 per hour. Create an equation to represent the total cost for a job, dependent on the number of hours. Is this a direct or partial relationship? How do you know?

**Example 4:**

Consider the following table of values. Create an equation to represent the same relationship.

|  |  |
| --- | --- |
| *x* | *y* |
| 0 | 10 |
| 1 | 14 |
| 2 | 18 |
| 3 | 22 |
| 4 | 26 |