

Section 1.3 Analyse Quadratic Functions

- Determine if each equation represents a linear or quadratic function.
 - $y = 4x - 3$
 - $f(x) = x^2 + 4$
 - $h(t) = -4.9t^2 + 22.4t - 19.4$
 - $5x + 3y = 13$
 - $y = 2$
 - $g(x) = 2(x + 3)^2$
 - $y = \frac{3}{4}x + 3$
 - $f(x) = 14 + 0.5x^2$
- For each set of data, identify the relation as linear, quadratic, or neither. Calculate the first and second differences, if necessary.

a)

x	y
1	2
2	5
3	10
4	17
5	26

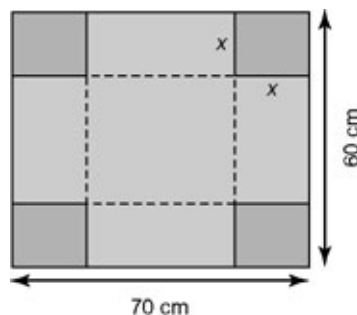
b)

Number of Floors	Number of Windows
1	0
2	10
3	20
4	30
5	40

c)

Time (s)	Bacteria (millions)
1	2
2	4
3	8
4	16
5	32

- The height, h , in metres, of a ball t seconds after it is thrown from a certain height is modelled by the function $h(t) = -4.9(t - 2)^2 + 50$.
 - Create a table of values for $t = 0, 1, \dots, 5$.
 - Determine whether $h(t)$ is quadratic.
 - Use the table to graph $h(t)$.
 - Identify the axis of symmetry, direction of opening, the coordinates of the vertex, the domain, and the range.
- A 60 cm by 70 cm sheet of tin will have squares cut out at the corners as shown. The side length of each cut-out square will be a whole number of units. The four sides will be folded up to make a box with an open top.



- Let x represent the side length of each cut-out square. What are the possible values of x ? Explain.
- Create a table of values with x in column 1 and the total area of the four sides of the box in column 2.
- Determine whether the relation between the side length of each cut-out square and the total area of the sides is quadratic.
- Use the table of values to determine the side length of each cut-out square that will produce the maximum area of the four sides.