3.1 Relations

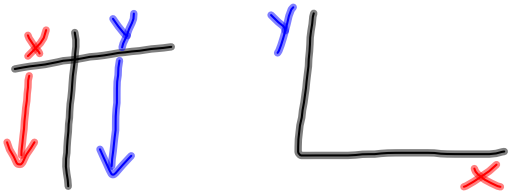
Example One

The cost of a pizza with tomato sauce and cheese is $9.00. It costs $0.75 for each additional topping.

a) Create a table of values from 0 – 8 toppings.

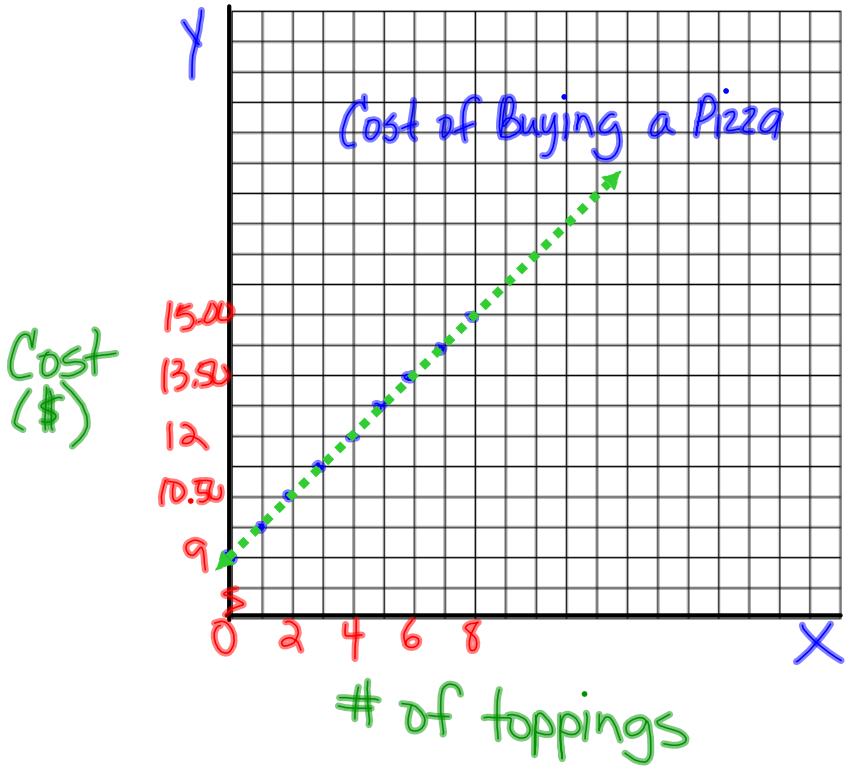
Number of Toppings	Cost ($)
0	$0.75 \times 0 + 9 = 9.00$
1	$0.75 \times 1 + 9 = 9.75$
2	$0.75 \times 2 + 9 = 10.50$
3	$0.75 \times 3 + 9 = 11.25$
4	$0.75 \times 4 + 9 = 12.00$
5	$0.75 \times 5 + 9 = 12.75$
6	$0.75 \times 6 + 9 = 13.50$
7	$0.75 \times 7 + 9 = 14.25$
8	$0.75 \times 8 + 9 = 15.00$

Independent Variable – The variable whose value you choose. Usually placed on the left in a table and on the horizontal axis on a graph.



Dependent Variable – The variable whose value you calculate. Usually placed on the right in a table and on the vertical axis on a graph.

b) Graph this relation. Label the dependent and independent variable.



Note: The points in this graph are joined with a broken line since we cannot order a fraction of pizza toppings. The number of toppings ordered is an example of discrete data.

→ usually whole numbers.

Discrete Data – A set of data that cannot be broken into smaller parts.

c) Represent the relation with an algebraic expression or rule.

Note:
DEPENDENT VARIABLE = variable cost × **INDEPENDENT VARIABLE** + fixed cost

Cost = 0.75 x #of toppings + 9

C = 0.75 n + 9

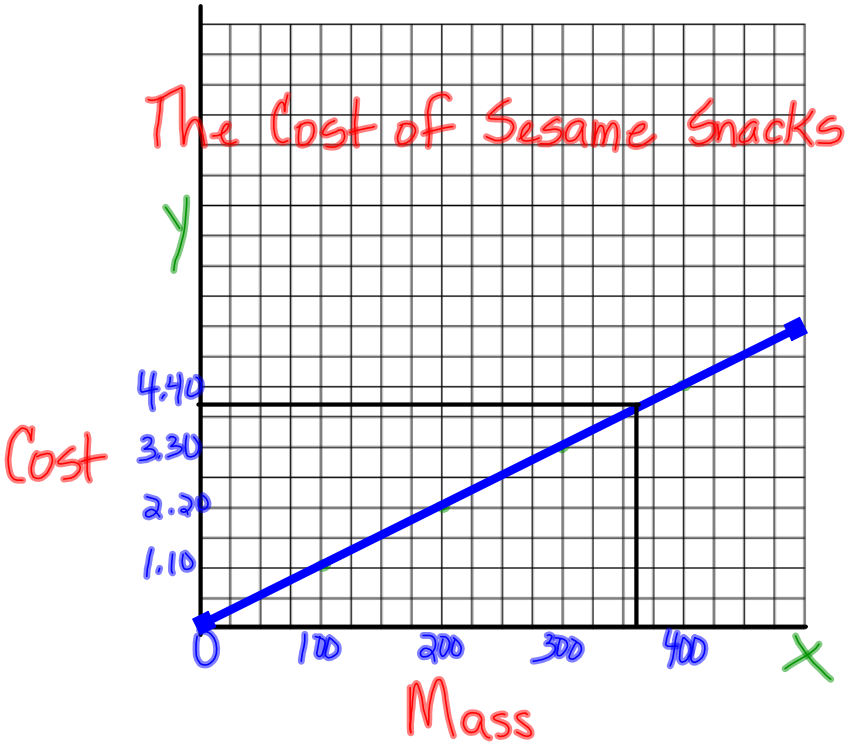
C = cost
n = # of toppings

Example Two

Rhonda bought sesame snacks at the bulk food store. The cost was $1.10 per 100g.

a) Determine the cost of 360 g using a graph.
Hint: create a table first.

Mass	Cost
100	$1.10
200	$2.20
300	$3.30
400	$4.40



∴ 360 g cost about $3.90.

Note: The points in this graph are joined with a solid line. The number of grams purchased is an example of continuous data.

→ decimal numbers make sense.

Continuous Data – A set of data that can be broken down into smaller and smaller parts and still have meaning.

To solve for 360 g you will interpolate.

Interpolate – To estimate a value between two known values.

b) Create an equation to determine the cost of 360 g.

$$\text{Cost} = 0.011 \times \text{Mass} + 0$$

Complete: p. 146 – 149 #3, 5, 6 (use a table), 8, 10, 14.