RMIT UNIVERSITY

MATHS FOR PRICES AND MARKETS

APPLICATIONS OF LINEAR GRAPHS

Linear graphs are used to solve a number of problems. Some examples are linear equations, simultaneous equations and inequalities.

In this section we will use linear graphs to solve equations.
If the relationship between two variables is graphed then the graph can be used to find one variable, given a value for the other.

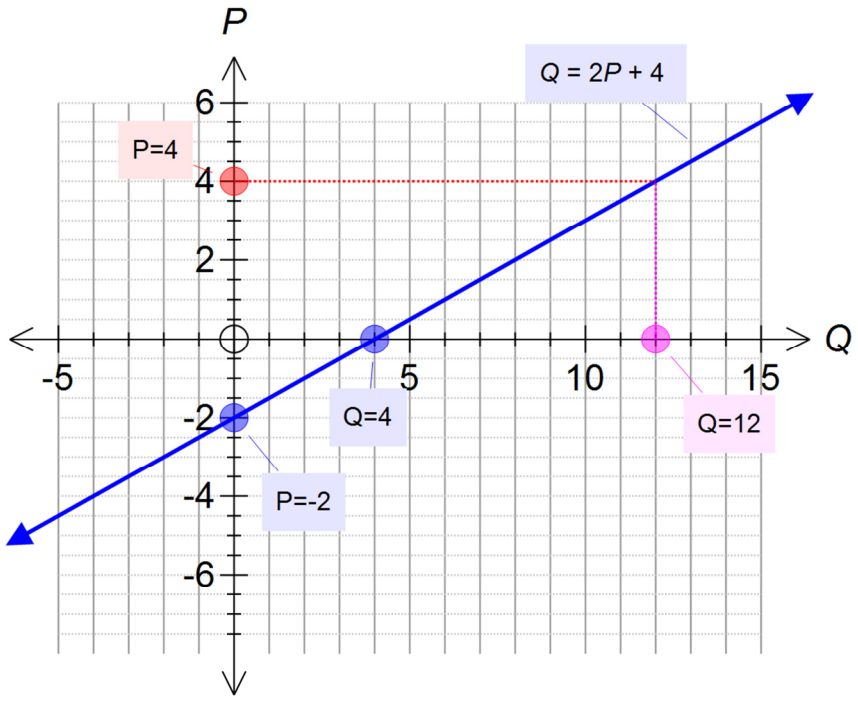
Examples

1.The relationship between the price per item P, (in thousands of dollars), of a diamond ring and quantity Q (number diamonds) is given by:
$Q = 2P+4$

(a) sketch the graph of the curve
(b) find the price of a ring given that the number of diamonds is 12. (Q = 12)

(a) Sketch graph
P- intercept . When Q = 0, P = –2.
Q-Intercept. When P = 0, Q = 4
Plot the points and join with a straight line.

(b) From the point on the horizontal axis where Q=12 move vertically up to the curve $Q = 2P+4$.
From this point move horizontally to the P axis and read the value of P.(P=4)
Q = 12, P = 4.



The price of a ring with 12 diamonds is $4,000.

2.Suppose the relationship between the price per item P, (in dollars) and the quantity Q (number of items) is given by:

$Q = 80 - 2P$

(a).Sketch the graph of the curve
(b).Find the number of items if the price per item is $20

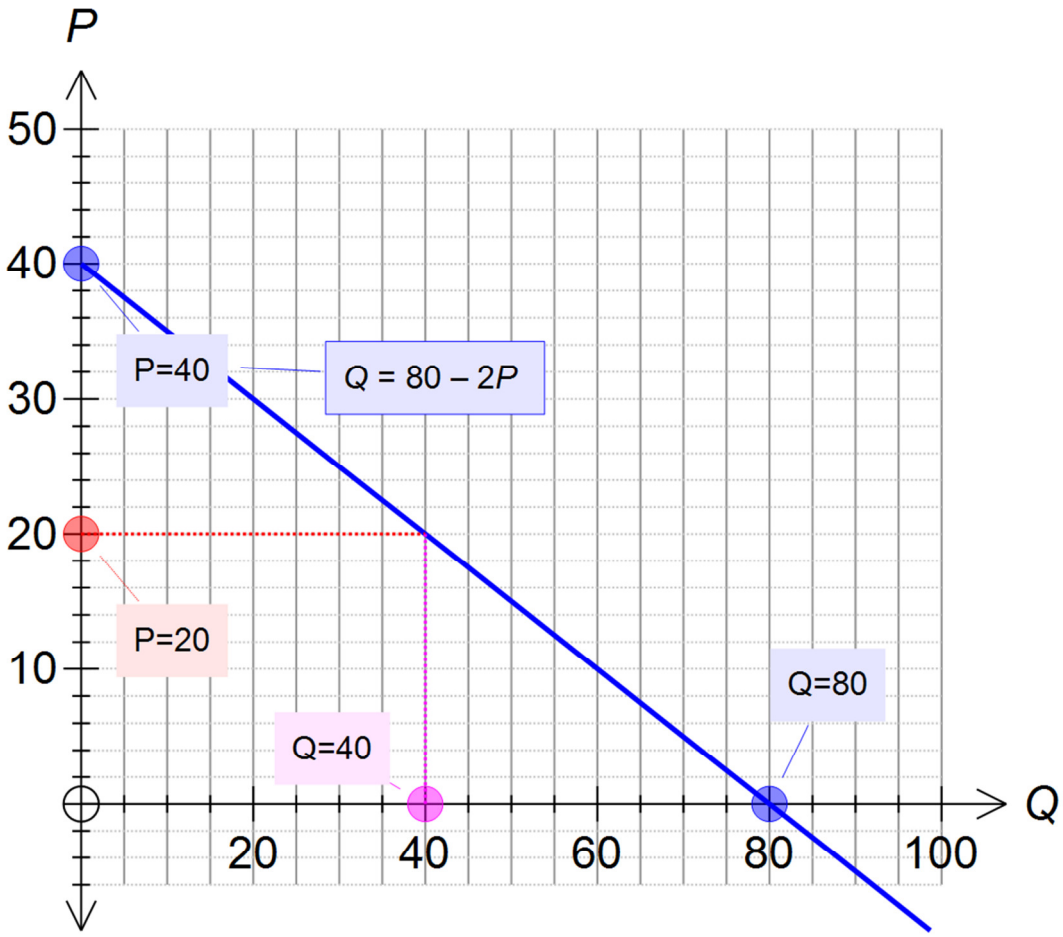
(a).Graph

P- intercept . When Q = 0, P = 40
Q-Intercept. When P = 0, Q = 80

Plot the points and join with a straight line.

(b). From the point on the vertical axis where P=20 move horizontally to the curve $Q = 80 - 2P$
From this point move vertically down to the Q axis and read the value of Q.(Q=40)
P = 20, Q = 40.

If the price per item is $20, the number of items is 40.



See exercises 1 and 2.

Exercises

Exercise 1

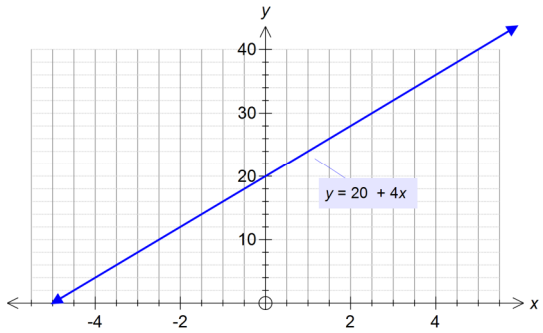
Sketch the curve y = 20 + 4x and find
(a) the value of y when x = 3.
(b) the value of x when y = 40
(c) the value of x when y = 16

Exercise 2

Sketch the curve Q = 150 – 2P and find
(a) the value of Q when P = 30
(b) the value of P when Q = 110
(c) the value of P when Q =75

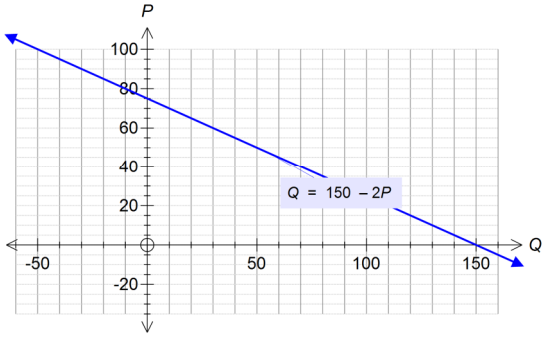
Answers

Exercise 1.



(a) y = 32 (b) x = 5 (c) x = – 1

Exercise 2



(a) Q = 90 (b) P = 20 (c) P = 37.5