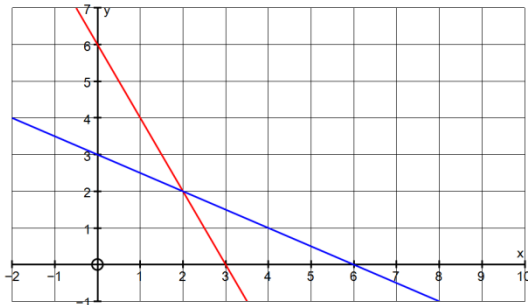


# Graphical solutions of simultaneous equations

## A: Using graphs to solve simultaneous linear equations.

For each question, fill in the coefficients of  $x$  and  $y$  for both equations.  
Then write down the solution of the simultaneous equations by finding their point of intersection.

1.

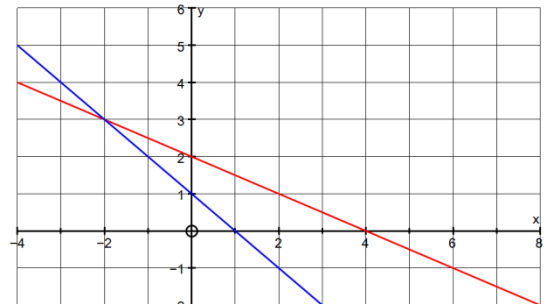


.....  $x$  + .....  $y$  = 12  
 .....  $x$  + .....  $y$  = 12

**Solution:**

$x$  = ..... ,  $y$  = .....

2.

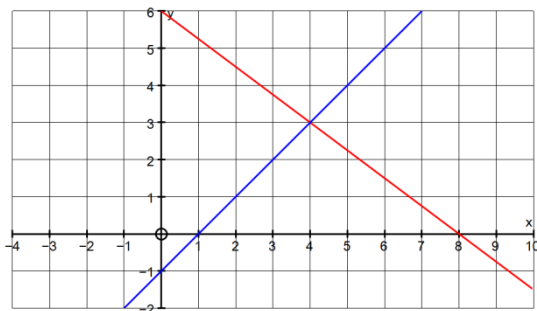


.....  $x$  + .....  $y$  = 4  
 .....  $x$  + .....  $y$  = 1

**Solution:**

$x$  = ..... ,  $y$  = .....

3.

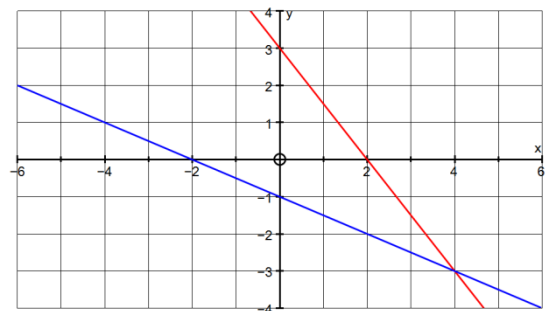


.....  $x$  + .....  $y$  = 24  
 .....  $x$  + .....  $y$  = 1

**Solution:**

$x$  = ..... ,  $y$  = .....

4.



.....  $x$  + .....  $y$  = 6  
 .....  $x$  + .....  $y$  = -2

**Solution:**

$x$  = ..... ,  $y$  = .....

## B: Quadratic equations recap

Solve each of these quadratic equations using whichever method you like.

- a  $x^2 - 8x + 12 = 0$
- b  $x^2 + 2x - 15 = 0$
- c  $x^2 - 6x - 16 = 0$
- d  $x^2 + 10x + 25 = 0$
- e  $x^2 - 49 = 0$

**Extension:**

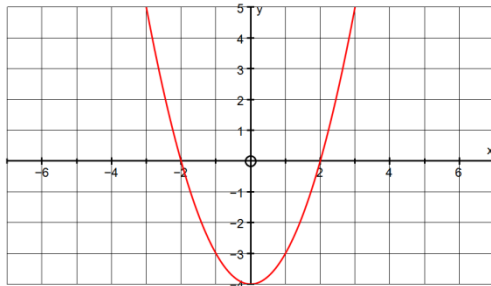
- e  $4x^2 - 169 = 0$
- f  $(x^2)^2 - 5x^2 + 4 = 0$

# Graphical solutions of simultaneous equations

## A: Using graphs to solve simultaneous equations when one is quadratic

Solve these simultaneous equations graphically. The quadratic graph is already drawn for you. Draw the linear graph and write down the solution of the simultaneous equations by finding their point of intersection.

1.

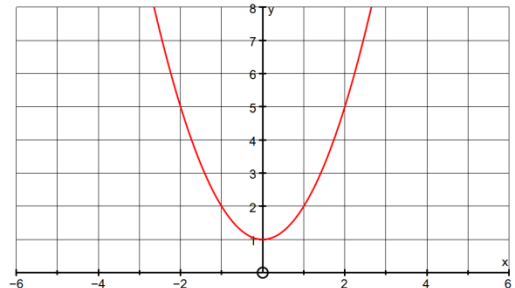


$$y = x^2 - 4$$
$$y - 2x = -1$$

**Solution:**

$$x = \dots\dots\dots, y = \dots\dots\dots$$

2.

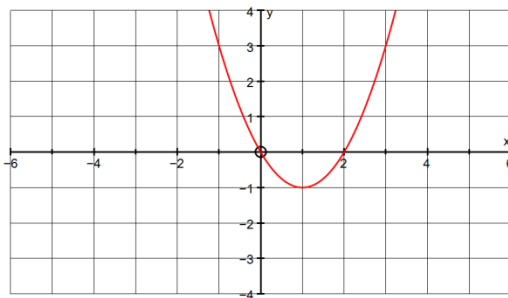


$$y = x^2 + 1$$
$$y = x + 3$$

**Solution:**

$$x = \dots\dots\dots, y = \dots\dots\dots$$

3.

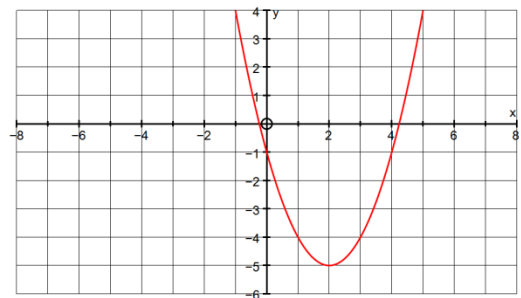


$$y = x^2 - 2x$$
$$y = 2x - 3$$

**Solution:**

$$x = \dots\dots\dots, y = \dots\dots\dots$$

4.



$$y = x^2 - 4x - 1$$
$$y = -2x + 2$$

**Solution:**

$$x = \dots\dots\dots, y = \dots\dots\dots$$

## Graphical solutions of simultaneous equations

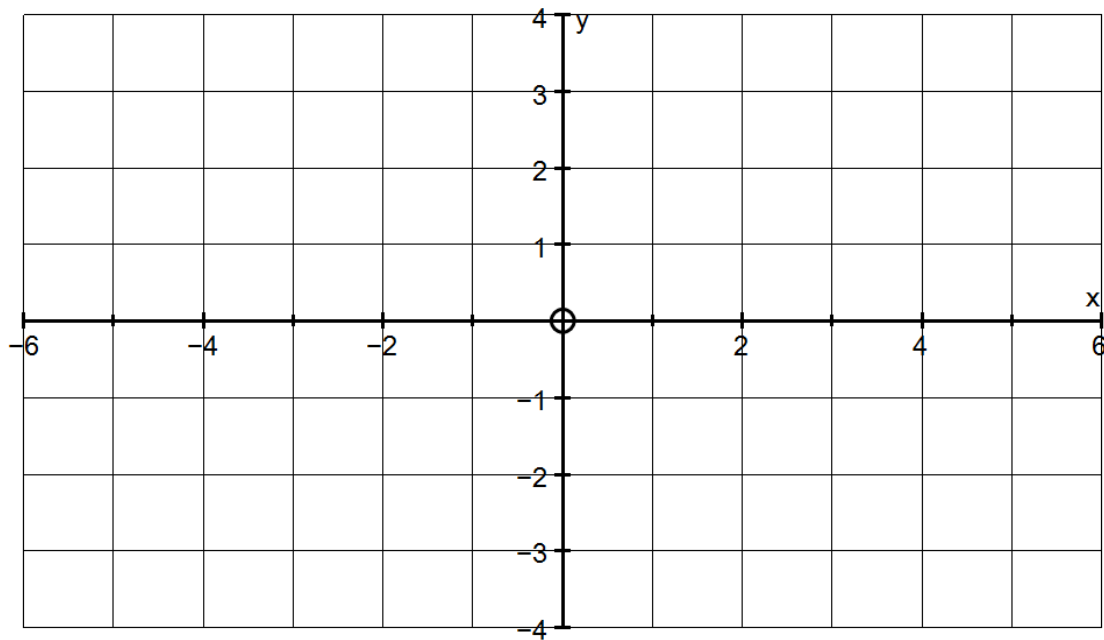
### Extension

$$y = (x^2)^2 - 5x^2 + 4$$

$$y = 0$$

Draw graphs to solve these equations simultaneously. You may wish to use a table of values.

x	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
y									



**Solution:**

$$x = \dots\dots\dots, y = \dots\dots\dots$$

$$x = \dots\dots\dots, y = \dots\dots\dots$$

$$x = \dots\dots\dots, y = \dots\dots\dots$$

$$x = \dots\dots\dots, y = \dots\dots\dots$$

Teaching Notes

A.

1.

$$2x + 4y = 12$$

$$4x + 2y = 12$$

Solution:

$$x = 2$$

$$y = 2$$

2.

$$x + 2y = 4$$

$$x + y = 1$$

Solution:

$$x = -2$$

$$y = 3$$

3.

$$x + 2y = 4$$

$$x + y = 1$$

Solution:

$$x = -2$$

$$y = 3$$

4.

$$x + 2y = 4$$

$$x + y = 1$$

Solution:

$$x = -2$$

$$y = 3$$

B.

a  $x = 6, 2$

b  $x = 3, -5$

c  $x = -2, 8$

d  $x = -5$  (repeated root)

e  $x = 7, -7$

Extension:

f  $x = 6.5, -6.5$

g  $x = -2, -1, 1, 2$

C.

a  $(x,y) = (-1,3)$  and  $(3,5)$

b  $(x,y) = (-1, 2)$  and  $(2,5)$

c  $(x,y) = (1,-1)$  and  $(3,3)$

d  $(x,y) = (-1,4)$  and  $(3,-4)$

Extension:

x	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
y	0	-2.188	0	2.813	4	2.813	0	-2.188	0

$(x,y) = (-2,0), (-1,0), (1,0)$  and  $(2,0)$