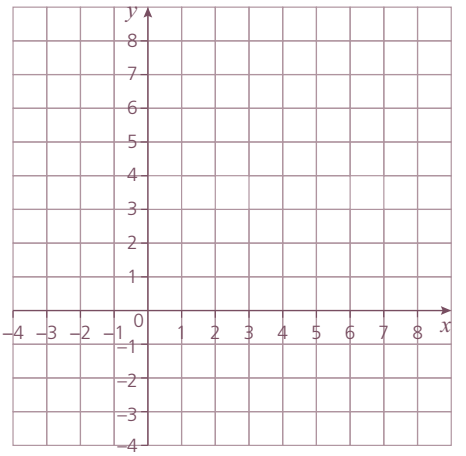
6 Simultaneous equations

1 Solve the following pairs of simultaneous equations graphically.

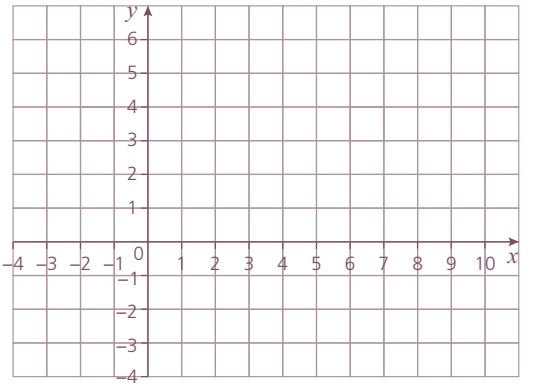
a) $y = x + 4$

$y = 2x + 2$



b) $x + 3y = 9$

$2x - y = 4$



Use the substitution method to solve the simultaneous equations in questions **2** and **3**.

2 $2x + y = 13$

$y = 2x + 1$

3 $3x + 2y = 6$

$y = x - 2$

Use the elimination method to solve the simultaneous equations in questions **4** and **5**.

4 $x + y = 6$

$x - y = 2$

5 $2x + y = 10$

$3x - y = 5$

6 Four tins of soup and 3 packs of bread rolls cost $10:80.
Two tins of soup and 5 packs of bread rolls cost $9:60.
Find the cost of 3 tins of soup and 7 packs of bread rolls.

7 In a sale, 3 DVDs and 4 CDs cost $51 and 4 DVDs and 3 CDs cost $54.

a) Find the cost of a DVD and the cost of a CD.

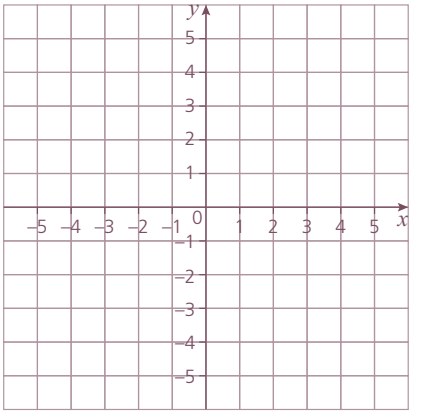
b) I have $90 dollars to spend and would like to buy the same number of DVDs and CDs.
How many of each can I buy?

8 **a)** Solve this pair of simultaneous equations algebraically:

$x^2 - 6x - y = -8$

$y - x + 4 = 0$

b) Illustrate the solution graphically.



9 Solve this pair of simultaneous equations algebraically:

$x^2 - y^2 + xy = 20$

$x = 2y$

10 Two numbers, x and y, have a difference of 2 and a product of 15.

a) Write down two equations that are satisfied by x and y.

b) Find two possible values for the pair of numbers by solving the equations simultaneously.

11 a) Solve this pair of simultaneous equations algebraically:

$(x - 2)^2 + (y - 3)^2 = 9$

$x - y + 4 = 0$

b) Given that $(x - 2)^2 + (y - 3)^2 = 9$ is the equation of a circle, with centre (2,3) and radius $\sqrt{9}$, illustrate the solution graphically.