

Q Completing the Square

(c) $(x+a)^2 = x^2 + 22x + b$

Find the value of a and the value of b .

$a =$
 $b =$ [2]

24 (a) Write $x^2 - 4x + 7$ in the form $(x-a)^2 + b$.

..... [2]

(b) Write down the coordinates of the turning point of the graph of $y = x^2 - 4x + 7$.

(..... ,) [1]

24 $x^2 - 16x + a$ can be written in the form $(x + b)^2$.

Find the value of a and the value of b .

$a =$
 $b =$ [2]

20 $x^2 - 12x + a = (x + b)^2$

Find the value of a and the value of b .

$a =$
 $b =$ [2]

12 Solve $x^2 - 2x - 6 = 0$.

Give your answer in the form $a \pm \sqrt{b}$ where a and b are integers.

..... [3]

14

$$x^2 - 14x + c = (x + d)^2$$

Find the value of c and the value of d .

$$c = \dots\dots\dots$$

$$d = \dots\dots\dots [3]$$

18 (a) Write $x^2 - 18x - 27$ in the form $(x + k)^2 + h$.

$$\dots\dots\dots [2]$$

(b) Use your answer to **part (a)** to solve the equation $x^2 - 18x - 27 = 0$.

$$x = \dots\dots\dots \text{ or } x = \dots\dots\dots [2]$$

9 (a) (i) Write $x^2 + 8x - 9$ in the form $(x + k)^2 + h$.

..... [2]

(ii) Use your answer to **part (a)(i)** to solve the equation $x^2 + 8x - 9 = 0$.

$x =$ or $x =$ [2]

23 $x^2 + 8x + 10 = (x + p)^2 + q$

(a) Find the value of p and the value of q .

$p =$

$q =$ [2]

(b) Solve.

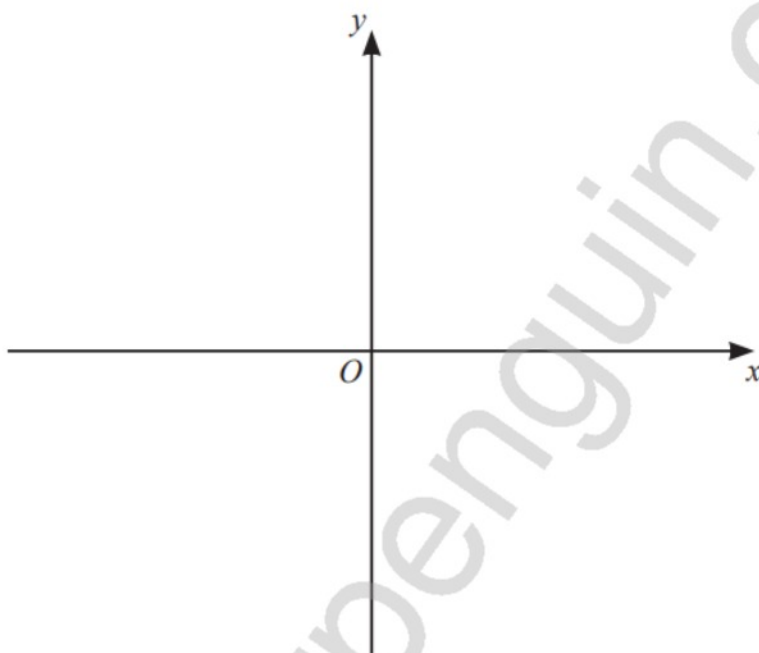
$$x^2 + 8x + 10 = 30$$

$x =$ or $x =$ [2]

(c) (i) Write $x^2 + 10x + 14$ in the form $(x + a)^2 + b$.

..... [2]

(ii) On the axes, sketch the graph of $y = x^2 + 10x + 14$, indicating the coordinates of the turning point.



[3]

(b) (i) Write $x^2 + 4x + 1$ in the form $(x + p)^2 + q$.

..... [2]

(ii) Use your answer to **part (b)(i)** to solve the equation $x^2 + 4x + 1 = 0$.

$x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

(iii) Use your answer to **part (b)(i)** to write down the coordinates of the minimum point on the graph of $y = x^2 + 4x + 1$.

(..... ,) [2]

18 $2x^2 + 12x - 2$ can be written in the form $a(x+b)^2 - c$.

Find the values of a , b and c .

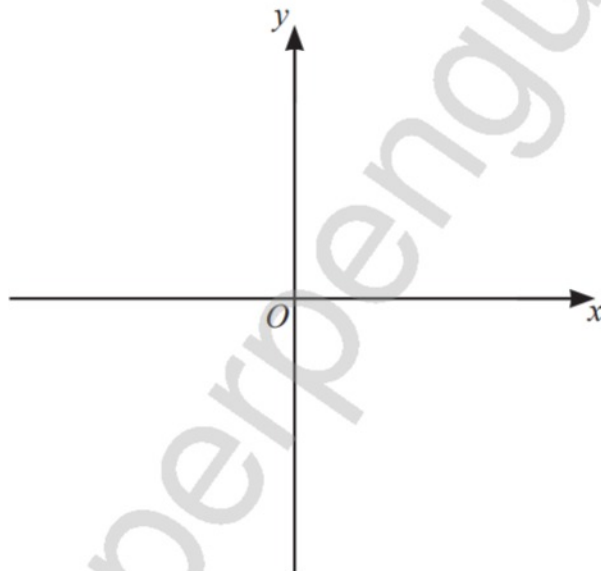
$a = \dots\dots\dots$, $b = \dots\dots\dots$, $c = \dots\dots\dots$ [3]

(b) $g(x) = 18 - 3x - x^2$

(i) Write $g(x)$ in the form $b - (a + x)^2$.

..... [3]

(ii) Sketch the graph of $y = g(x)$.
On your sketch, show the coordinates of the turning point.



[3]

(d) The expression $5 + 12x - 2x^2$ can be written in the form $q - 2(x + p)^2$.

(i) Find the value of p and the value of q .

$p = \dots\dots\dots$, $q = \dots\dots\dots$ [3]

(ii) Write down the coordinates of the maximum point of the curve $y = 5 + 12x - 2x^2$.

($\dots\dots\dots$, $\dots\dots\dots$) [1]

(b) The solutions of the equation $x^2 + bx + c = 0$ are $\frac{-7 + \sqrt{61}}{2}$ and $\frac{-7 - \sqrt{61}}{2}$.

Find the value of b and the value of c .

$b = \dots\dots\dots$
 $c = \dots\dots\dots$ [3]

16 The solutions to the equation $x^2 + gx + h = 0$ are $\frac{1 - \sqrt{17}}{2}$ and $\frac{1 + \sqrt{17}}{2}$.

Find the value of g and the value of h .

$g = \dots\dots\dots$
 $h = \dots\dots\dots$ [3]