# Completing the Square

1. Complete the square for the following quadratic expressions:

(a) $x^2+10x+3$ (b) $x^2+14x-5$

(c) $x^2-6x+3$ (d) $y^2-16y-10$

(e) $y^2+8y-1$ (f) $x^2-20x+7$

(g) $x^2+4x-7$ (h) $x^2+10x$

(i) $y^2+18y$ (j) $x^2-12x$

(k) $x^2+6x$ (l) $x^2+14x$

2. Complete the square for the following quadratic expressions:

(a) $2x^2-20x-6$ (b) $2x^2-12x+8$

(c) $2x^2+16x+4$ (d) $3x^2+12x+9$

(e) $5x^2-10x-20$ (f) $2x^2-8x$

(g) $4x^2+24x$ (h) $3x^2-18x$

3. Complete the square for the following quadratic expressions:

(a) $x^2+9x+2$ (b) $x^2+7x+3$

(c) $x^2-11x+8$ (d) $x^2-3x-10$

(e) $x^2+x-5$ (f) $x^2-5x$

(g) $x^2-9x$ (h) $2x^2+10x-6$

(i) $2x^2-6x+4$ (j) $2x^2-7x-8$

(k) $2x^2+5x-2$ (l) $2x^2-9x-7$

4. Express $x^2+8x+21$ in the form $(x+a)^2+b$, where *a* and *b* are integers to be found.

5. By completing the square, express the quadratic expression $x^2-10x+40$ in the form $(x-a)^2+b$, where *a* and *b* are integers to be found.

6. Express $x^2 - 6x + 20$ in the form $(x + a)^2 + b$, where *a* and *b* are integers to be found.

7. Express $2x^2 - 16x - 2$ in the form $a(x + b)^2 + c$, where *a*, *b* and *c* are integers to be found.

8. Express the following quadratic expressions in the form $a(x + b)^2 + c$, stating the values of *a*, *b* and *c* in each case.

   (a) $2x^2 + 8x - 6$ (b) $3x^2 - 24x$

   (c) $2x^2 - 10x - 8$ (d) $-x^2 + 12x + 5$

9. Given that $x^2 + 10x - 3 = (x + a)^2 - b$, find the constants *a* and *b*.

10. Given that $x^2 - 8x + 21 = (x - a)^2 + b$, find the constants *a* and *b*.

12. Given that $x^2 - 12x + 17 = (x + a)^2 - b$, find the constants *a* and *b*.

13. Given that $x^2 - 2x - 13 = (x + a)^2 + b$, find the constants *a* and *b*.