

Factorising

Fully factorise:

- a) $4x + 20$
- b) $6x - 9$
- c) $4ab + 6ac$

Completing the squareWrite in the form $a(x + b)^2 + c$:

- a) $x^2 - 4x + 3$
- b) $x^2 + 5x + 6$
- c) $2x^2 + 4x + 9$

Algebraic fractions

Simplify:

a) $\frac{1}{x+3} + \frac{3}{2-x}$

b) $\frac{x^2 + 11x + 30}{x^2 - 36}$

Solve for x :

c) $\frac{2}{x-5} = \frac{x}{x-3}$

Iterationa) Show that $x^3 + 4x = 2$ can be written as

$$x = \frac{1}{2} - \frac{x^3}{4}$$

b) Use the formula $x_{n+1} = \frac{1}{2} - \frac{x_n^3}{4}$ with $x_0 = 0$ to find a solution accurate to 3 decimal places to $x^3 + 4x = 2$

Simplifying expressions

Simplify:

- a) $2a \times 3b \times 4c$
- b) $28xy \div 4y$
- c) $4a + 3b - 5a$

Expanding brackets

Remove the brackets by multiplying:

- a) $3(x + 2)$
- b) $-2(3x - 5)$
- c) $x(x - 4)$

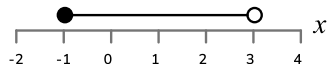
Changing the subjecta) Given $v = u + at$ make a the subjectb) Given $P = I^2 R$ make I the subject.**Product of binomials**

Expand and simplify:

- a) $(x + 3)(x + 5)$ c) $(x - 1)(x + 1)(x - 3)$
- b) $(2x + 1)(3x - 1)$ d) $(2x - 3)^3$

Inequalities

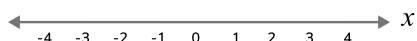
a) Write the inequality that is described by the number line:



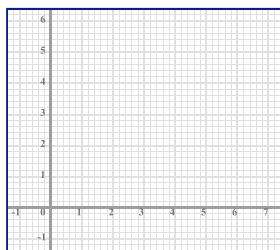
b) Find the set of integers satisfying the inequality:

$$-3 \leq n < 2$$

c) Solve the inequality $2x + 7 > 5$, representing your solution on the number line:



d) Shade the region that simultaneously satisfies the inequalities $x < y$, $x + y \geq 6$ and $x \leq 5$



e) Solve the inequality: $x^2 - 2 \geq 23$

SubstitutionLet $a = 4$, $b = -1$, $c = 5$, $d = -2$

Evaluate:

- a) $d - 3b$ d) $\frac{abc}{d}$
- b) ab e) $d^2 - a$
- c) $ad - bc$ f) $(a + b)^2 - d$

Simultaneous equationsSolve each pair of equations for x and y :

- a) $x + y = 21$
 $x - y = 9$
- b) $4x + 3y = 23$
 $3x - 2y = -4$
- c) $y = 2x^2 - 4x + 1$
 $y = 5 - 2x$

Solving quadratic equations

Solve by factorising:

- a) $x^2 + x - 6 = 0$
- b) $x^2 - 64 = 0$

Solve by factorising:

$$x^2 - 5x - 13 = 0$$

Solve by completing the square:

$$x^2 + 3x - 7 = 0$$

Factorising quadratics

Factorise:

- a) $x^2 - 7x + 12$ c) $6x^2 + 17x + 12$
- b) $x^2 - 25$ d) $8x^2 - 52x + 24$

Equations of one unknownSolve for x :

- a) $17 - x = 9$ c) $5x + 2 = 16 - x$
- b) $3x + 7 = 22$ d) $18 - 7x = 31 - 9x$