

O Level E Maths Tutorial 7: Equations and inequalities

Syllabus :

- solving linear equations in one variable
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1. Solve $5x + 6 = -7$.

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- solving simple fractional equations that can be reduced to linear equations such as:

$$\frac{x}{3} + \frac{x+2}{4} = 3$$

$$\frac{3}{x-2} = 6$$

2. Solve these equations:

(i) $\frac{x}{3} + \frac{x+2}{4} = 3$

(ii) $\frac{3}{x-2} = 6$

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- solving simultaneous linear equations in two variables by
 - substitution and elimination methods
 - graphical method
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3. (i) Solve these equations for x and y.

$$\begin{aligned} y &= 2x + 1 \\ y &= -x + 3 \end{aligned}$$

(ii) Sketch the graphs of these two lines to show how they can be solved graphically.

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- solving quadratic equations in one unknown by
 - factorisation
 - use of formula
 - completing the square for $y = x^2 + px + q$
 - graphical method
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4. (i) Expand $(x+1)(x-2)$.

(ii) Hence use the factorisation method to solve $x^2 - x - 2 = 0$.

5. The solutions of

$$ax^2 + bx + c = 0$$

are

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Use this formula to solve $x^2 - x - 2 = 0$.

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- solving fractional equations that can be reduced to quadratic equations such as:

$$\frac{6}{x+4} = x+3$$

$$\frac{1}{x-2} + \frac{2}{x-3} = 5$$

6. Solve these equations.

(a) $\frac{6}{x+4} = x+3$

(b) $\frac{1}{x-2} + \frac{2}{x-3} = 5$

• formulating equations to solve problems

7. Solve the following simultaneous equations:

$$\begin{aligned}x + y &= 1 \\ 2x - 3y &= 4\end{aligned}$$

8. The mass of a small pot is a kg.
The mass of a small pot is b kg.

Ajay buys 5 small pots and 2 large pots with a total mass of 119 kg.
Bhanu buys 5 small pots and 3 large pots with a total mass of 165 kg.

Form and solve two simultaneous equations to find the mass of a small pot and the mass of a large pot.

[N22/I/6]

• solving linear inequalities in one variable, and representing the solution on the number line

9. Solve these inequalities. In each case, represent the solution on the number line.

(i) $2x > 4$

(ii) $2x + 5 > 2 - 8x$

10. Solve these inequalities. In each case, represent the solution on the number line.

(i) $(x + 3)(x - 2) > 0$

(ii) $(x + 4)(x - 5) \leq 0$