

Chapter 3

Equations and Inequalities

Chapter Overview

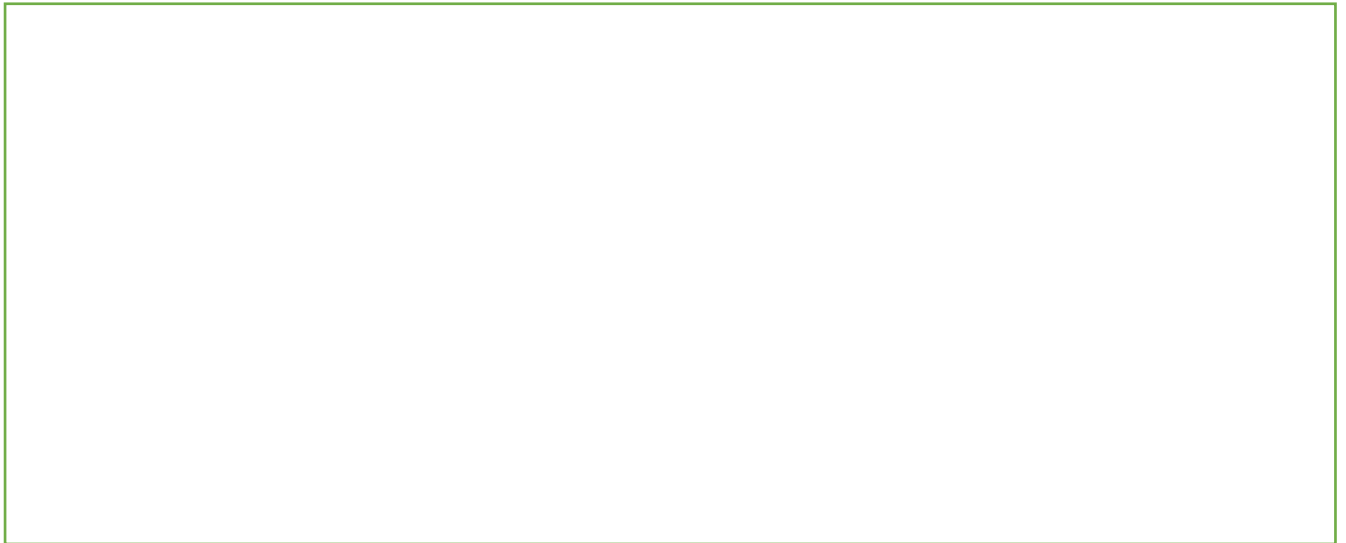
1. Simultaneous Equations
2. Simultaneous Equations Using Graphs
3. Set Builder Notation
4. Solving Inequalities
5. Sketching Inequalities

2.4	<p>Solve simultaneous equations in two variables by elimination and by substitution, including one linear and one quadratic equation.</p>	<p>The quadratic may involve powers of 2 in one unknown or in both unknowns, e.g. solve $y = 2x + 3, y = x^2 - 4x + 8$ or $2x - 3y = 6, x^2 - y^2 + 3x = 50$</p>
-----	--	---

2.5	<p>Solve linear and quadratic inequalities in a single variable and interpret such inequalities graphically,</p> <p>including inequalities with brackets and fractions.</p> <p>Express solutions through correct use of 'and' and 'or', or through set notation.</p> <p>Represent linear and quadratic inequalities such as $y > x + 1$ and $y > ax^2 + bx + c$ graphically.</p>	<p>e.g. solving $ax + b > cx + d,$ $px^2 + qx + r \geq 0,$ $px^2 + qx + r < ax + b$</p> <p>and interpreting the third inequality as the range of x for which the curve $y = px^2 + qx + r$ is below the line with equation $y = ax + b$</p> <p>These would be reducible to linear or quadratic inequalities</p> <p>e.g. $\frac{a}{x} < b$ becomes $ax < bx^2$</p> <p>So, e.g. $x < a$ or $x > b$ is equivalent to $\{x : x < a\} \cup \{x : x > b\}$ and $\{x : c < x\} \cap \{x : x < d\}$ is equivalent to $x > c$ and $x < d$</p> <p>Shading and use of dotted and solid line convention is required.</p>
-----	--	---

Simultaneous Equations

Linear Equations:



Example:

Solve the simultaneous equations

$$3x + y = 8$$

$$2x - 3y = 9$$

Method 1 : Elimination

Method 2: Substitution