Name	Date started	Target end date

WJEC Level 2 Additional Mathematics — Question Pack

Solving pairs of equations — including one linear and one quadratic — by substitution or elimination.

REVISE
.wales

Simultaneous equations

Algebra · Level 2 Certificate (9550) · calculator allowed

Solving pairs of equations — including one linear and one quadratic — by substitution or elimination.

LEVEL 2 · 9550

Estimated time for entire question pack: ~53 minutes

*At the Additional Maths pace of **~1.2 min/mark** (44 marks across 6 questions).*

*You are advised to **not** attempt to complete all of this in one sitting.*

ABOUT THIS QUESTION PACK

This is a **focused single-topic practice pack**, not a single mock paper. It gathers every question on this topic from the 2011–2024 papers.

Questions are ordered by year, newest first.

INSTRUCTIONS

Use black ink or black ball-point pen. Show all working — method marks are awarded for clear setup.

A calculator is allowed throughout this qualification.

Simultaneous equations — what's examined

WJEC Level 2 Additional Mathematics (9550) · single written paper, calculator allowed.

Linear pairs Algebra

- Eliminate a variable, or substitute.
- Solve for one unknown, then back-substitute.
- State both values.

Linear & quadratic Algebra

- Substitute the linear equation into the quadratic.
- Solve the resulting quadratic.
- Find the matching second values.

Presentation Method

- Pair up the solutions correctly.
- Show the substitution step.
- Check in the original equations.

Crib sheet »

Simultaneous equations in one page

Quick-reference notes — revisit before each question. Don’t use during the questions.

Elimination

Scale equations so one variable matches, then add or subtract to remove it.

Substitution

Rearrange the linear equation for one variable and substitute into the other.

One-linear-one-quadratic

Always substitute into the quadratic — you’ll get up to two (x, y) pairs.

Pairing

Each x value has its own y value — keep them matched.

8. Solve the following simultaneous equations.

$$y = 5x^2 + 6x - 7$$
$$y = 2x + 3$$

Use an algebraic method and give your answers correct to 2 decimal places. [6]

9. The diagram shows a rectangular-based pyramid.
The length of the rectangular base is 4 cm and the width of the base is 3 cm.
Each slant edge of the pyramid is of length 6 cm.

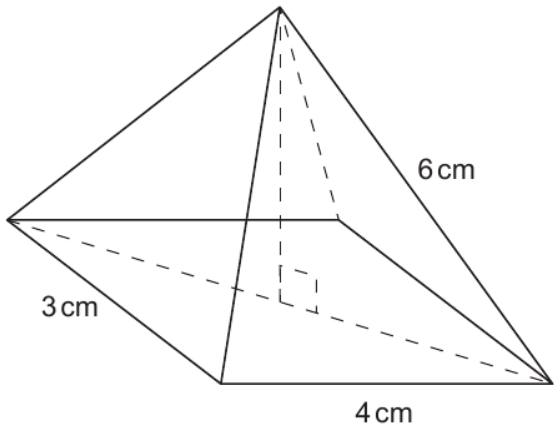


Diagram not drawn to scale

Calculate the perpendicular height of the pyramid.
You must show your working. [3]

The perpendicular height is cm

11.

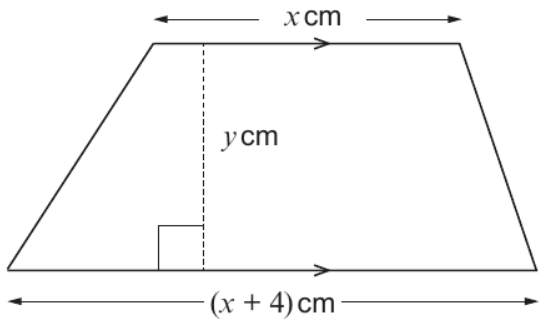


Diagram not drawn to scale

The area of the trapezium in the diagram is 28 cm^2.
A rectangle of length $(x + y)$ cm and width y cm has an area of 43 cm^2.

(a) Show that $xy = 28 - 2y$ and $xy = 43 - y^2$. [3]

(b) Hence write down a quadratic equation in terms of y to calculate the lengths of the parallel sides of the trapezium.
You must use an algebraic method, **not** a trial and improvement method. [4]

12. *(a)* Find $\frac{d^2y}{dx^2}$ when $y = 2x^6 + 3x$. [2]

(b) Find $\int 3x^4 + 6x + 8x^{-2}\,dx$. [4]

(c) Showing all your working, evaluate $\int_2^5 4x + 1\,dx$. [5]

3. Consider two squares of different sizes.
The perimeter of the larger square is 12 cm greater than the perimeter of the smaller square.
The area of the larger square is $30\,cm^2$ greater than the area of the smaller square.

Calculate the dimensions of each square.
You must use an algebraic method, **not** a trial and improvement method.

[7]

4. The coordinates of the points A and B are (3, 9) and (–5, 7) respectively.

(a) Calculate the length of the line AB.
Express your answer as a surd in its simplified form $a\sqrt{b}$.

[3]

(b) *You will be assessed on the quality of your written communication in this part of the question.*
Find the equation of the straight line perpendicular to AB that passes through the midpoint of AB. Express your answer in the form $y = mx + c$.

[10]

10. Solve the simultaneous equations

$$2x + y = 13,$$
$$x^2 + xy - 30 = 0.$$

[6]

11. *You will be assessed on the quality of your written communication in this question.*

A right-angled triangle, ABC, has an area of $1350\,\text{cm}^2$.
The hypotenuse of the right-angled triangle, AC, is 75 cm and the perimeter is 180 cm.
Given that $AB = x$ cm and $BC = y$ cm, calculate the lengths of the sides AB and BC of the right-angled triangle.

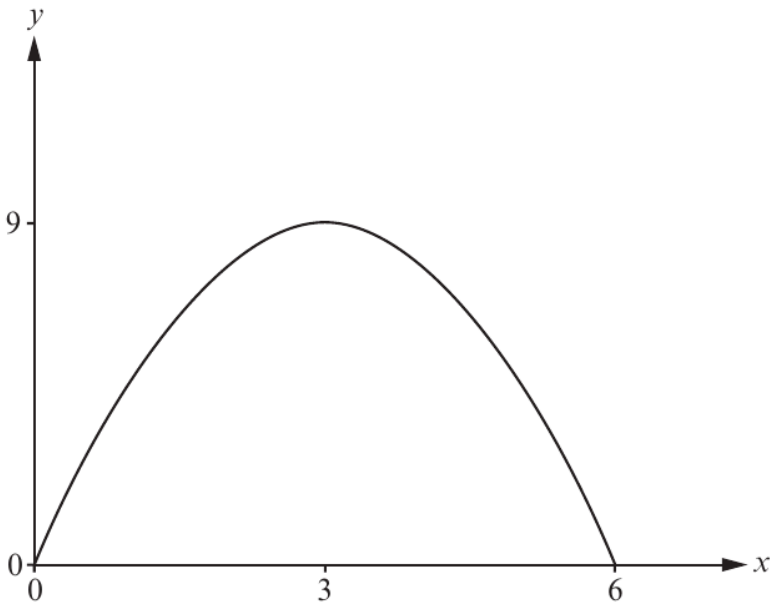
[9]

11. *You will be assessed on the quality of your written communication in this question.*

A right-angled triangle, ABC, has an area of $1350\,\text{cm}^2$.
The hypotenuse of the right-angled triangle, AC, is 75 cm and the perimeter is 180 cm.
Given that $AB = x$ cm and $BC = y$ cm, calculate the lengths of the sides AB and BC of the right-angled triangle.

[9]

12. The diagram shows the curve $y = 6x - x^2$.



Showing all your working, calculate the area of the region bounded by the curve $y = 6x - x^2$ and the x-axis.

[5]

7. *You will be assessed on the quality of your written communication in this question.*

A rectangle A has sides of length $(x + 1)$ cm and $(y + 3)$ cm.
The perimeter of A is 62 cm.
A rectangle B has sides of length $(x + 9)$ cm and $(2x + y)$ cm.
The area of B is 703 cm^2.

Calculate the dimensions of both these rectangles.

[9]

End of question pack