

2.3 Simultaneous

Name: _____ Class: _____ Date: _____

KEY WORDS elimination

<!-- Session 2 native-skill companion -->

Objective

Practise simultaneous within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Simultaneous equations and feasible regions · Foundation

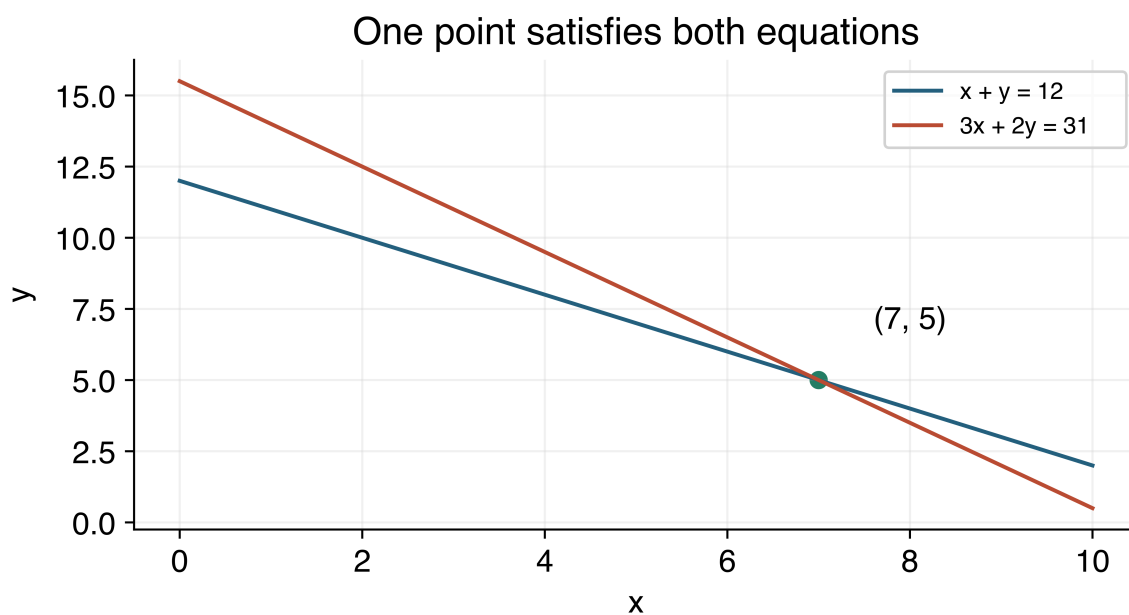
For two linear equations, use elimination or substitution and check both equations. For a line and a quadratic, substitute the linear relation first; then solve the resulting quadratic. For inequalities, shade the region satisfying every condition.

$$x + y = 12, \quad 3x + 2y = 31$$

If $x+y=12$ and $3x+2y=31$, subtract twice the first equation from the second to obtain $x=7$, then $y=5$. For $y=x+1$ and $y=x^2-1$, $x^2-x-2=0$ gives $x=2$ or -1 , with $y=3$ or 0 .

One equation checked is not enough. A line can meet a quadratic twice, so retain both solutions unless the context removes one. Inequality boundaries may be included or excluded according to the sign.

Define the variables and their units. If they count objects, both must be nonnegative integers. For a feasible region, test one point on the required side of each boundary and then take the intersection.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) Solve $x + y = 12$ and $3x + 2y = 31$. Find x .

2.2 (Foundation) For those equations, find y .

2.3 (Foundation) Find the larger x -coordinate where $y = x + 1$ meets $y = x^2 - 1$.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: A pair of simultaneous equations is solved by checking just one of them.

Solutions

2.1 Subtract twice $x+y=12$ from $3x+2y=31$: $x=31-24=7$.

2.2 Use $x+y=12$, so $y=12-7=5$.

2.3 Equate the graphs: $x^2-x-2=(x-2)(x+1)=0$. The larger root is 2.

3.1 False. The point $(0,12)$ satisfies $x+y=12$ but not $3x+2y=31$. The solution $(7,5)$ satisfies both equations: $7+5=12$ and $21+10=31$.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.