Simultaneous Equations and Inequalities – Test A (35 mins) Fundamentals ✓Challenge Expert

Subtopics: Linear simultaneous equations, quadratic simultaneous equations, simultaneous equations on graphs, linear inequalities, quadratic inequalities, inequalities on graphs, regions

1. Solve the simultaneous equations:

$$2x+3y=9$$
$$6y-x=3$$

[4]

2. Solve the simultaneous equations:

$$x+y=6$$
$$x^2-2x+y=4$$

[5]

3. Solve the following inequalities:
   a) $x^2-9<0$ **[4]**
   b) $x^2+6x+11\geq 20-2x$ **[4]**

4. a) Sketch the curve $y=x^2-x-20$, labelling **all** points where the curve crosses the **axes**. **[4]**
   b) On your sketch, shade the region that satisfies the inequality $y\leq x^2-x-20$ and label it **R**. **[1]**

5. Solve the simultaneous equations:

$$x-y+5=0$$
$$2x^2-xy-2x=-10$$

[6]

6. Solve the simultaneous equations:

$$2x-y=1$$
$$y^2=x^2+4x-3$$

[6]

7. Solve the following inequalities:
   a) $2x^2-x-6>0$ **[4]**
   b) $5x^2+2x-3<3x^2+5x+2$ **[4]**

8. a) Sketch the graphs of $y=x^2-5x-6$ and $y=0$ on the **same set of axes**. Shade the region that satisfies **both** the inequalities $y>x^2-5x-6$ and $y\leq 0$. Label this region **R**. **[6]**
   b) Hence find the range of values of x that satisfy the inequality $x^2-5x-6<0$ **[2]**

TOTAL 50 MARKS