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SESSION 4: QUADRATIC INEQUALITIES AND SIMULTANEOUS EQUATIONS

X-planation

QUADRATIC INEQUALITIES

Find the roots of the quadratic equation. These are your critical values. Use a number line or sign table to find where the inequality is negative or positive. You can also use a parabola when solving quadratic inequalities. Make sure that the coefficient of the term in x^2 is positive. Don't forget to change the sign of the inequality when multiplying or dividing throughout by a negative.

SIMULTANEOUS EQUATIONS

The method of elimination is far quicker with simultaneous linear equations than the method of substitution.

With simultaneous equations involving linear and non-linear equations, always work with the linear equation first and choose a variable with a coefficient of 1. Make that variable the subject of the formula. This will make the substitution into the non-linear equation a much more efficient process.

X-ample Questions

Question 1

Solve for *x*:

(a) $x^2 > x + 6$ (4)

(b) $9 - x^2 \geq 0$ (4)

Question 2

Solve the following equations:

(a) $x - y = 2$ and $2x + y = 10$ (4)

(b) $2x - 3y = 10$ and $4x + 5y = 42$ (4)

Question 3

Solve for *x* and *y*:

(a) $3x - y = 2$ and $3y + 9x^2 = 4$ (7)

(b) $y - 2x = -2$ and $2x^2 = 2 - y^2$ (7)

Question 4

Solve for *x* and *y*:

(a) $2x + y = 3$ and $x^2 + y + x = y^2$ (8)

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X-ercises

Question 1

Solve for *x*:

(a) $x^2 \geq 100$ (4)

(b) $20-(x+1)(x+2)>0$ (4)

(c) $x^2 > x+6$ (4)

(d) $9-x^2 \geq 0$ (4)

Question 2

Solve for *x* and *y*:

$3x+2y=6$ and $5x+3y=11$ (6)

Question 3

Solve for *x* and *y*:

$x-3y=1$ and $x^2-2xy+9y^2=17$ (DoE Feb/Mar 2009) (8)