Test - Simultaneous equations, inequalities and polynomials

Year: Year 12 · Duration: 60 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	5	4	4	3	4	**20**
Mark						

Show your working.

Question 1 (5 marks)

Question 1 – Simultaneous equations

Solve the simultaneous equations $x - y = 2$ and $xy = 15$.

Question 2 (4 marks)

Question 2 – Inequalities

Solve $2x^2 - 7x - 4 \geq 0$.

Also solve $3(x - 2)$ and hence find the values of x that satisfy both inequalities.

Question 3 (4 marks)

Question 3 – Factor theorem

$f(x) = x^3 - 4x^2 + x + 6$.

a. Show that $(x - 2)$ is a factor of $f(x)$. (1 mark)
b. Factorise $f(x)$ completely. (3 marks)

Question 4 (3 marks)

Question 4 – Remainder theorem

When $p(x) = 2x^3 + ax - 5$ is divided by $(x - 2)$ the remainder is 7. Find a.

Question 5 (4 marks)

Question 5 – Problem: a rectangular lawn

The length of a rectangular lawn is 3 m more than its width w m. The area is 54 m^2.

a. Show that $w^2 + 3w - 54 = 0$. (1 mark)
b. Find the dimensions of the lawn. (2 marks)
c. Edging costs £4.50 per metre. Find the cost of edging the whole perimeter. (1 mark)