FOUNDATION & HIGHER

HIGHER EXTENDS

Name ..... Class .....

A22: Inequalities

Solve problems involving linear and quadratic inequalities

20 marks · 25 minutes · Non-calculator

1) A taxi charges £3 plus £1.50 per mile. Lou has £20. Find the greatest whole number of miles she can travel.

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[Question 1: 3 marks]

2) A rectangle is $(x+5)$ cm by x cm. Its perimeter is less than 50 cm and its area is more than 24 cm^2. Find the range of possible values of x.

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[Question 2: 4 marks]

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3) n is an integer with $3n - 7 > 8$ and $2n + 1 < 21$. List the possible values of n.

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[Question 3: 3 marks]

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4) Find the integers x for which $x^2 - 7x + 10 < 0$

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[Question 4: 3 marks]

5) How many points with whole-number coordinates satisfy $x > 0$, $y > 0$ and $x + y < 4$?

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[Question 5: 3 marks]

6) Plan A costs £20 plus 2p per minute. Plan B costs 6p per minute. For what numbers of minutes is plan B cheaper?

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[Question 6: 2 marks]

7) A hall has 30 rows of seats, each with n seats. At most 400 people are allowed. Find the largest possible value of n.

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[Question 7: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	11	$3 + 1.5m \leqslant 20$ (P1); $m \leqslant 11.3$ (P1); A1.
2	$3 < x < 10$	$4x + 10 < 50$ (P1); $x^2 + 5x - 24 > 0$ (P1); $x > 3$ (P1); combined (A1).
3	6, 7, 8, 9	$n > 5$ (P1); $n < 10$ (P1); A1.
4	3 and 4	$(x - 2)(x - 5) < 0$ (P1); $2 < x < 5$ (P1); A1.
5	3	(1, 1), (1, 2), (2, 1) (P1, P1); A1.
6	Fewer than 500	$0.06m < 20 + 0.02m$ (P1); A1.
7	13	$30n \leqslant 400$ (P1); A1.