FOUNDATION & HIGHER

HIGHER EXTENDS

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

A22: Inequalities

Solve linear and quadratic inequalities; number lines and set notation

20 marks · 25 minutes · Non-calculator

1) Show the inequality $-2 < x \leqslant 3$ on the number line.



[Question 1: 2 marks]

2) Solve $4x - 3 > 9$

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[Question 2: 2 marks]

3) n is an integer and $-5 \leqslant 2n + 1 < 7$. List all the possible values of n.

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[Question 3: 2 marks]

4) (a) Solve $x^2 - x - 12 < 0$

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(3)

(b) Write your answer to (a) using set notation.

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(1)

[Question 4: 4 marks]

5) Write down the inequality shown on the number line.



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[Question 5: 1 marks]

6) Solve $3(x + 2) \leqslant 21$

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[Question 6: 2 marks]

7) Solve $7 - 2x > 1$

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[Question 7: 2 marks]

8) Solve $x^2 \geqslant 25$

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[Question 8: 2 marks]

9) Solve $2x + 1 < 5x - 8$

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[Question 9: 2 marks]

10) Find the largest integer that satisfies $4x - 1 < 18$

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[Question 10: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	Number line	Open circle at -2 and filled circle at 3 (B1); joined (B1).
2	$x > 3$	$4x > 12$ (M1); A1.
3	$-3, -2, -1, 0, 1, 2$	$-3 \leqslant n < 3$ (M1); A1.
4	(a) $-3 < x < 4$ (b) $\{x : -3 < x < 4\}$	(a) $(x - 4)(x + 3)$ (M1); critical values -3 and 4 (A1); correct region (A1). (b) B1.
5	$-1 \leqslant x < 4$	B1.
6	$x \leqslant 5$	$x + 2 \leqslant 7$ or $3x \leqslant 15$ (M1); A1.
7	$x < 3$	$-2x > -6$ or $6 > 2x$ (M1); A1.
8	$x \leqslant -5$ or $x \geqslant 5$	Critical values ± 5 (M1); A1.
9	$x > 3$	$9 < 3x$ (M1); A1.
10	4	B1.