GCSE Mathematics

Inequalities

Questions

Pearson Edexcel GCSE & iGCSE Mathematics

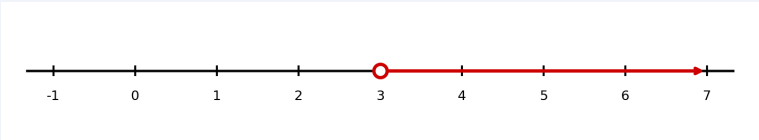
Section A — Foundation

Worked Examples

[Fluency]

Solve 3x + 1 > 10 and show on a number line.

$3x > 9 \Rightarrow x > 3$



[Reasoning]

Solve $-2x \leq 8$.

$x \geq -4$ (flip inequality when dividing by negative)

[Problem Solving]

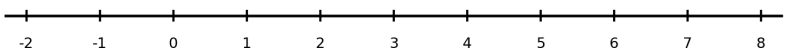
List the integer solutions of $-3 < x \leq 2$.

–2, –1, 0, 1, 2

[Fluency]

1.

Solve and show on a number line: 3x + 1 > 10



(3 marks)

[Fluency]

2. Solve: $-2x \leq 8$

(2 marks)

[Fluency]

3. Solve: $2x + 3 < x + 7$

(2 marks)

[Fluency]

4.

Solve the double inequality: $-1 \leq 2x + 3 < 7$

(3 marks)

[Fluency]

5.

List all the integer values of x that satisfy: $-3 < x \leq 2$

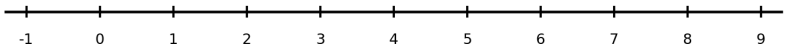
(2 marks)

[Reasoning]

6.

Solve: $4x - 3 \geq 2x + 7$

Show your answer on a number line.



(3 marks)

[Reasoning]

7.

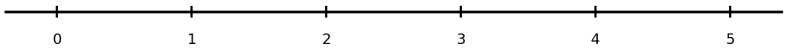
Find the largest integer value of n such that: $3n - 2 < 20$

(3 marks)

[Reasoning]

8.

Solve and show on a number line: $2 \leq 3x - 1 < 11$



(4 marks)

[Problem Solving]

9.

x is an integer. $-5 < 2x + 1 \leq 7$.

Write down all possible values of x.

(4 marks)

[Problem Solving]

10.

A rectangle has width x cm and length (x + 4) cm.

The perimeter is greater than 28 cm but less than or equal to 40 cm.

Find the range of values of x.

(4 marks)

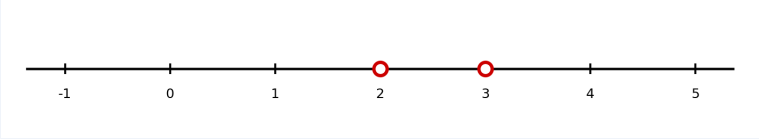
Section B — Higher

Worked Examples

[Fluency]

Solve $x^2 - 5x + 6 > 0$

$(x-2)(x-3) > 0 \Rightarrow x < 2$ or $x > 3$



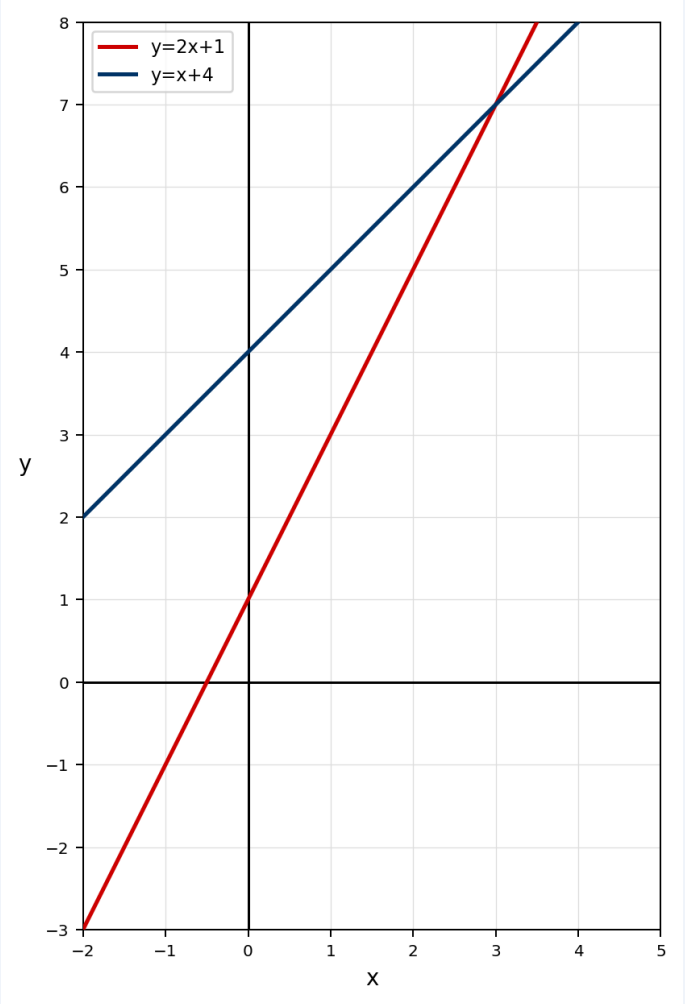
[Reasoning]

Solve $x^2 - x - 12 \leq 0$

$(x-4)(x+3) \leq 0 \Rightarrow -3 \leq x \leq 4$

[Problem Solving]

Show the region $y > 2x + 1$ and $y \leq x + 4$ on a graph.



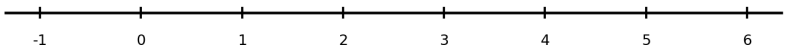
Shade the region above y=2x+1 and below/on y=x+4.

[Fluency]

1.

Solve: $x^2 - 5x + 6 > 0$

Show your answer on a number line.



(4 marks)

[Fluency]

2.

Solve: $x^2 - x - 12 \leq 0$

(4 marks)

[Fluency]

3.

Solve: $2x^2 + x - 6 < 0$

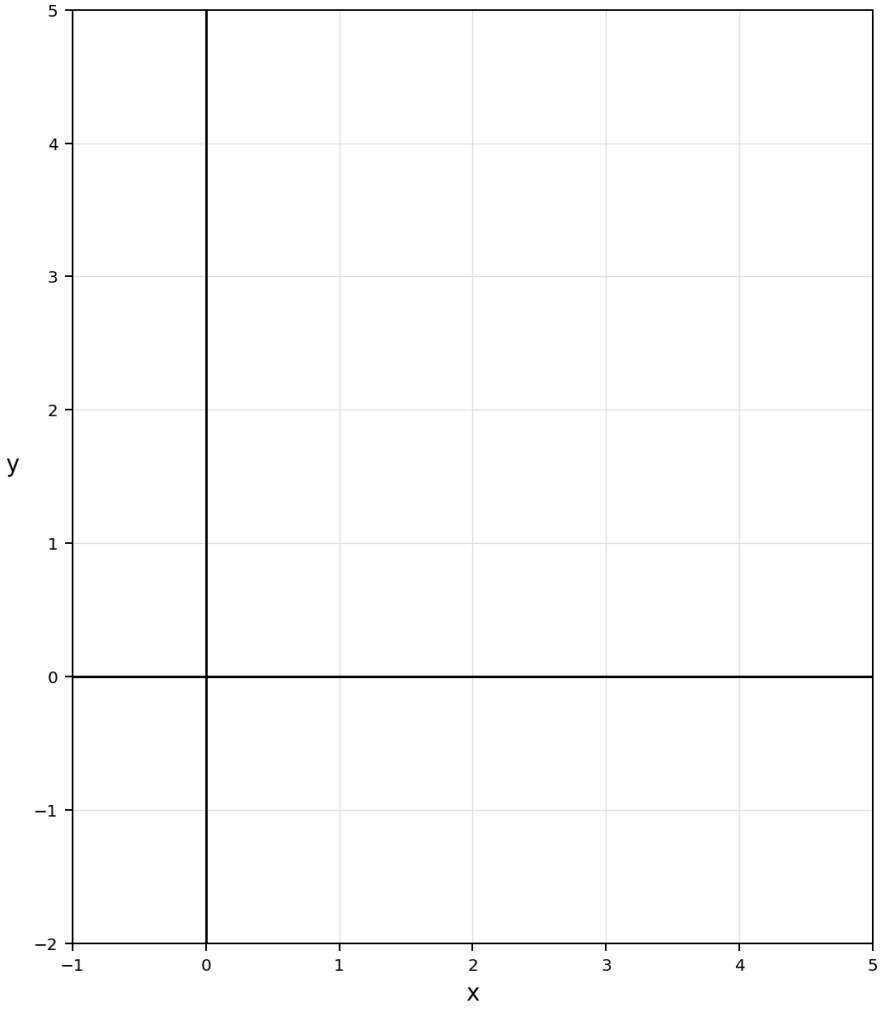
(4 marks)

[Reasoning]

4.

Represent the region satisfying all three inequalities on a graph:

$y > x - 1 \quad y \leq 3 \quad x \geq 0$



(4 marks)

[Reasoning]

5.

Find all integer values of x satisfying: $x^2 - 3x - 10 < 0$

(4 marks)

[Reasoning]

6.

Solve: $x^2 - 4 > 0$ and $2x + 1 < 7$ simultaneously.

Write your answer using set notation.

(5 marks)

[Problem Solving]

7.

Find the range of values of k for which the equation $x^2 + kx + 9 = 0$ has no real solutions.

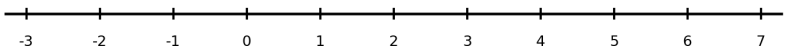
(4 marks)

[Problem Solving]

8.

Solve: $x^2 - 6x + 5 \leq 0$ and $x^2 + x - 6 > 0$.

Show your answer on a number line.



(6 marks)