Topic 07 – Linear and Quadratic Inequalities

Note: A link to the associated YouTube tutorial can be found at ALevelMathsRevision.com/bridging-the-gap/

Section A: Linear Inequalities (From OCR 6993)

Q1, (Jun 2010, Q1)

Solve the inequality $3 - x < 4(x - 1)$. **[3]**

Q2, (Jun 2013, Q2)

Find the integers that satisfy the inequality $-7 < 3x + 1 < 12$. **[4]**

Q3, (Jun 2014, Q1)

Solve the following.

$$-6 < 2x - 1 < 7$$

[3]

Q4, (Jun 2016, Q1)

Solve the inequality $1 - 2(x - 3) > 4x$. [3]

Q5, (Jun 2017, Q1)

Solve the inequality $-2 < 3x + 1 < 7$. [3]

Q6, (Jun 2018, Q1)

Solve the inequality $2 - x < 1 + 3(x - 2)$. [3]

Section B: Quadratic Inequalities (From OCR 4751)

Q1 (OCR 4751, Jun 2006, Q6)

Solve the inequality $x^2 + 2x < 3$. [4]

Q2 (OCR 4751. Jun 2009, Q4)

Solve the inequality $x(x - 6) > 0$. **[2]**

Q3 (OCR 4751, Jan 2013, Q4)

Solve the inequality $5x^2 - 28x - 12 \leqslant 0$. **[4]**

Q4 (OCR 4751, Jun 2014, Q6)

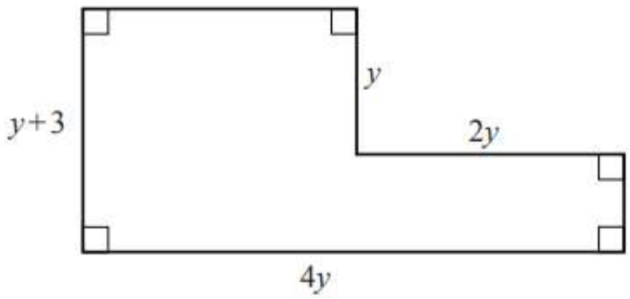
Solve the inequality $3x^2 + 10x + 3 > 0$. [3]

[More Questions Overleaf]

Q5 (OCR 4721, Jun 2012, Q9)

(i) A rectangular tile has length $4x$ cm and width $(x + 3)$ cm. The area of the rectangle is less than $112\,\text{cm}^2$. By writing down and solving an inequality, determine the set of possible values of x. **[6]**

(ii) A second rectangular tile of length $4y$ cm and width $(y + 3)$ cm has a rectangle of length $2y$ cm and width y cm removed from one corner as shown in the diagram.



Given that the perimeter of this tile is between 20 cm and 54 cm, determine the set of possible values of y. **[5]**

Q6 (OCR 4721, Jan 2005, Q8)

The length of a rectangular children's playground is 10 m more than its width. The width of the playground is x metres.

(i) The perimeter of the playground is greater than 64 m. Write down a linear inequality in x. [1]

(ii) The area of the playground is less than $299\,\text{m}^2$. Show that $(x - 13)(x + 23) < 0$. [2]

(iii) By solving the inequalities in parts **(i)** and **(ii)**, determine the set of possible values of x. [5]