**GCSE Inequalities: Regions**

**Starter Questions:**

**1.** *n* is an integer such that –5  2*n*  6

(a) List all the possible values of *n*.

……………………………..

(3)

(b) Solve the inequality 5 + *x* > 5*x* – 11

…………………………

(2)

(Total 5 marks)

**2.** Solve

…………………….

(Total 2 marks)

**3.** Solve 4 < *x* – 2  7

……………………………

(Total 3 marks)

[Nov 2012 1H] **4.**  The lines *y* = *x* – 2 and *x* + *y* = 10 are drawn on the grid.



On the grid, mark with a cross (×) each of the points with integer coordinates that are in the region defined by

**(3 marks)**

5(a) 4*x* + 3*y* < 12

*x* and *y* are both integers.

Write down two possible pairs of values that satisfy this inequality.

*x* = .............................., *y* = ..............................

and *x* = ............................., *y* = ..............................

(2)

(b) 4*x* + 3*y* < 12, *y* < 3*x*, *y* > 0,   
 *x* > 0

*x* and *y* are both integers.

On the grid, mark with a cross (×), each of the **three** points which satisfy **all** these four inequalities.

(3)

(Total 5 marks)

**6.** (a) On the grid below, draw straight lines and use shading to show the region **R** that satisfies the inequalities *x*  2 *y*  *x* *x* + *y*  6



(3)

The point *P* with coordinates (*x*, *y*) lies inside the region **R**.  
*x* and *y* are **integers**.

(b) Write down the coordinates of **all** the points of **R** whose coordinates are both integers.

................................................................................................................................................

(2)

(Total 5 marks)

**7.** –2 < *x*  1 *y* > –2 *y* < *x* + 1

*x* and *y* are integers.

On the grid, mark with a cross (), each of the six points which satisfies **all** these 3 inequalities.

(Total 3 marks)

**8.** The graphs of the straight lines with equations 3*y +* 2*x =* 12 and *y = x* – 1 have been drawn on the grid.



(a) Use the graphs to solve the simultaneous equations

3*y* + 2*x* = 12  
*y* = *x* –1

*x =* ..................................... *y =* .....................................

(1)

(b) 3*y* + 2*x* > 12 *y* < *x* – 1 *x* < 6

*x* and *y* are integers. On the grid, mark with a cross (×) each of the **four** points which satisfies **all**these 3 inequalities.

(3)

(Total 4 marks)



**9.** The line with equation 6*y* + 5*x* = 15 is drawn on the grid above.

(a) Rearrange the equation 6*y* + 5*x* = 15 to make *y* the subject.

*y* *=* .........................

(2)

(b) The point (–21, *k*) lies on the line.  
Find the value of *k*.

*k* = .........................

(2)

(c) (i) On the grid, shade the region of points whose coordinates satisfy the four inequalities

*y* > 0, *x* > 0, 2*x* < 3, 6*y* + 5*x* < 15

Label this region ***R.***

*P* is a point in the region ***R***. The coordinates of *P* are both integers.

(ii) Write down the coordinates of *P*.

(.......... , ..........)

(3)