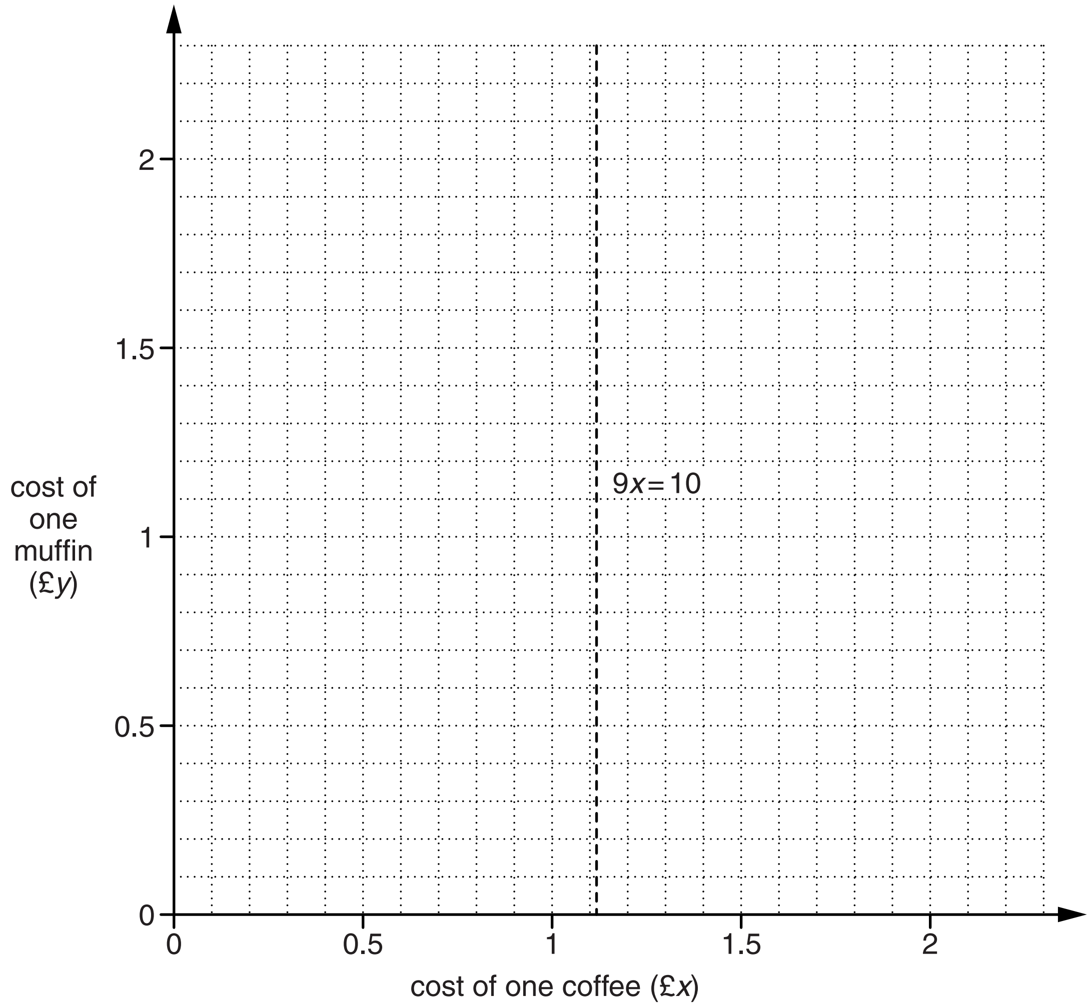


1 At a school event, muffins and co are sold.
Pippa has £10 to spend on muffins and coffees.

One coffee costs £x and one muffin costs £y.

(a) With £10, Pippa could buy a maximum of 9 coffees, so $9x < 10$.
The line $9x = 10$ has been drawn for you.

Indicate clearly, by shading, the region satisfying the inequality $9x < 10$.
Label this region R. **[1]**



(b) With £10, Pippa could also buy 5 coffees and 5 muffins, so $5x + 5y \leqslant 10$.

Indicate clearly, by shading, the region satisfying the inequality $5x + 5y \leqslant 10$.
Label this region T. **[2]**

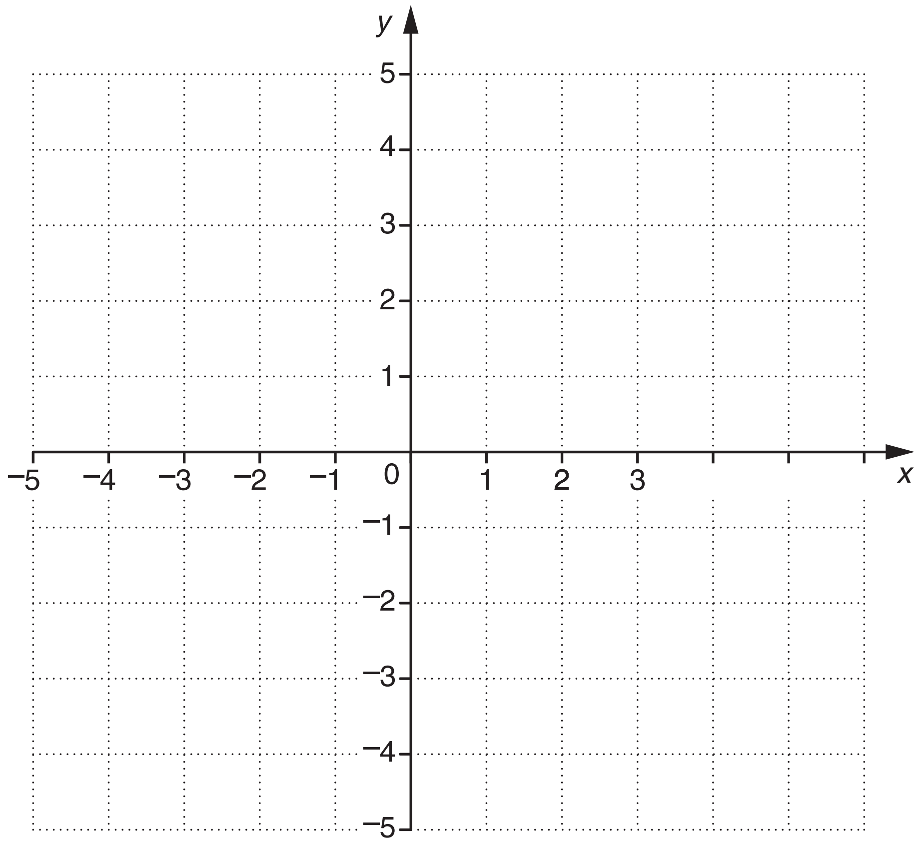
(c) At the event, muffins and coffee are each priced in multiples of 50p.
A coffee costs more than a muffin.

Represent this information on the diagram.
Using your diagram, write down the cost of one coffee and one muffin.

(c) One coffee costs £ ______________________________

One muffin costs £ ____________________________ **[3]**

2 **(a)** On the grid, draw the line $3x + 4y = 12$.



[2]

(b) On the grid, indicate clearly the region R which satisfies all the following inequalities.

$$3x + 4y < 12$$
$$x > 1$$
$$y > 0$$

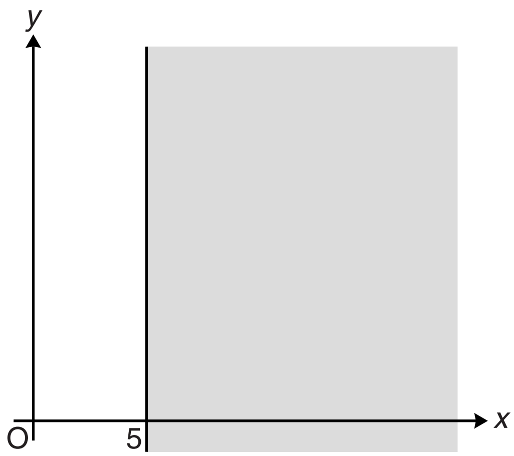
[2]

(c) Write down the integer values of x and y that satisfy all three inequalities.

(c) $x =$ ______________ $y =$ ______________ **[1]**

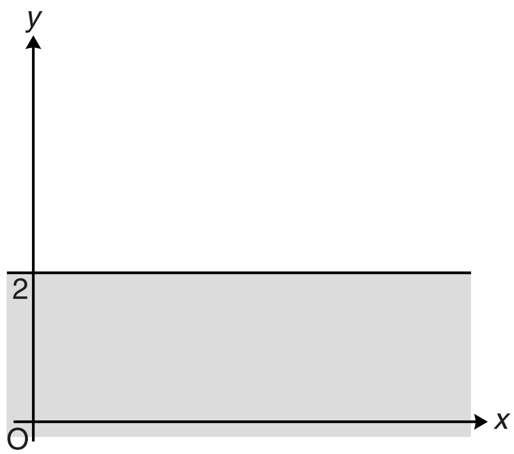
3 Write down the inequality represented by each of these shaded regions.

(a)



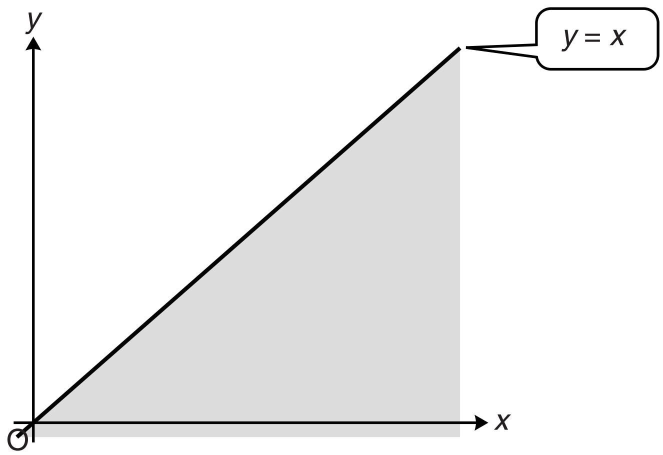
(a) ______________________________ **[1]**

(b)



(b) ______________________________ **[1]**

(c)

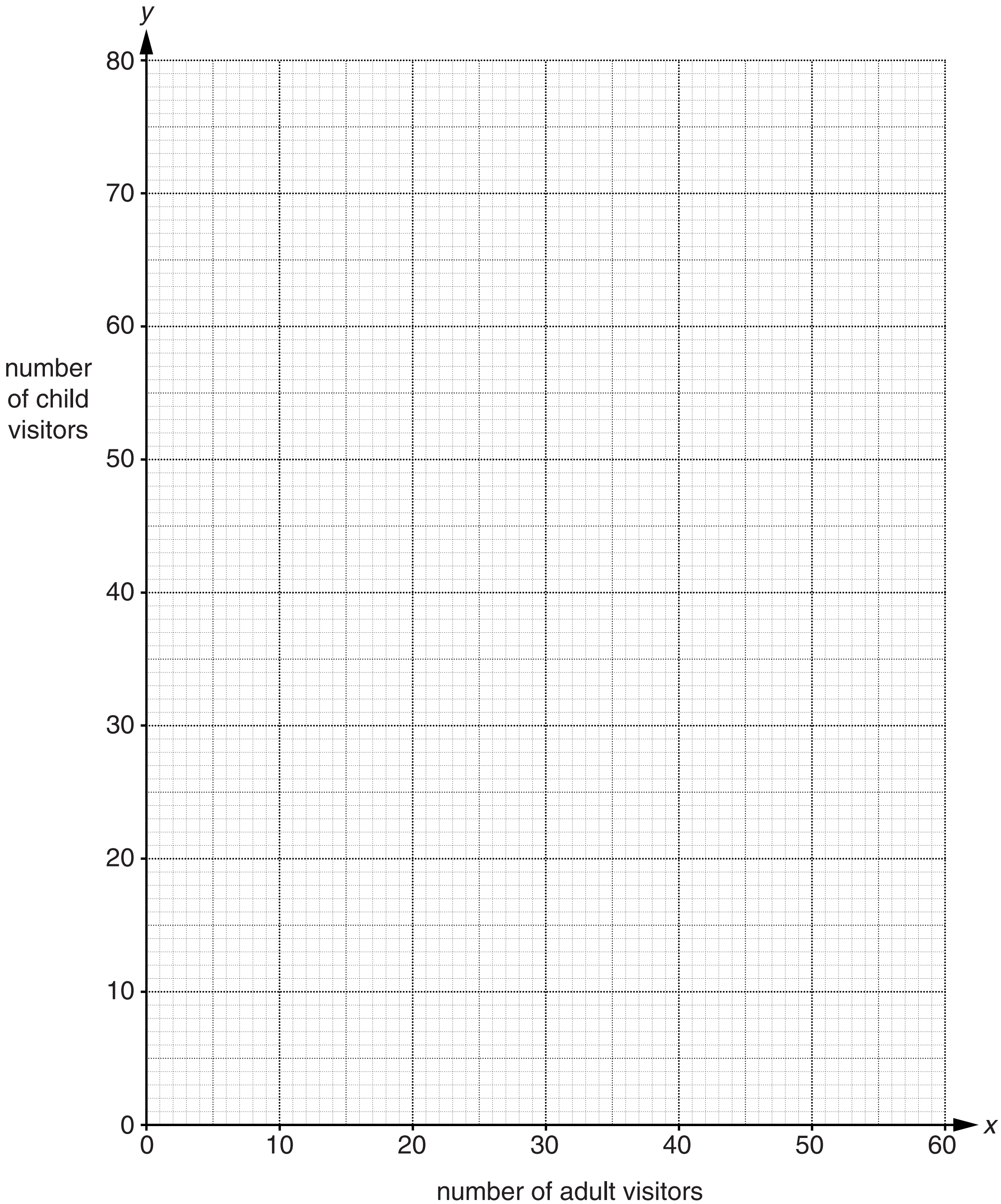


(c) ______________________________ **[1]**

4 The entry fee to a stately home is £6 for an adult and £5 for a child.
Kushala was working at the till and noticed that she had taken more than £300 in entry fees one morning.

Let x be the number of adult visitors and y the number of child visitors.

(a) On the grid, represent the inequality $6x + 5y > 300$.
Shade the area **not** required.



[2]

Kushala also noticed

- the number of child visitors was more than twice the number of adult visitors,
- there were less than 70 child visitors.

(b) **(i)** Write down two inequalities in x and y to represent this information.

(b)(i) ______________________________

______________________________ **[2]**

(ii) Represent your inequalities on the grid.
Shade the area **not** required. **[3]**

(c) Kushala's manager thinks they had 30 adult visitors and 50 child visitors that morning.

(i) Explain why the manager must be wrong.

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____ **[1]**

(ii) Write down one possible pair of values for the number of adult visitors (x) and child visitors (y) that fits all the conditions.

(c)(ii) ____________________ adult visitors

____________________ child visitors **[1]**