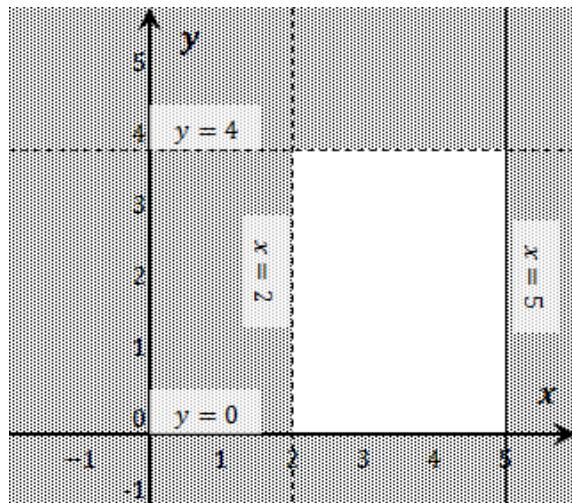


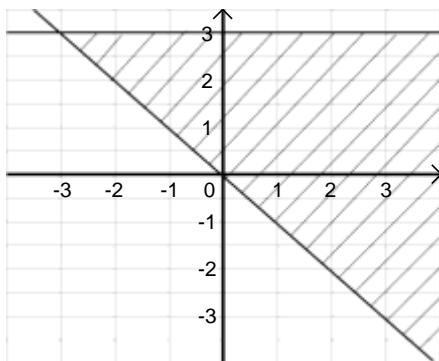
15 Inequalities

Simultaneous linear inequalities in one variable

2009-21.



2008-20.



2004-11.

Find the equations of 3 lines

$$y = 0$$

$$x = -1$$

$$y = -x$$

$$\therefore \begin{cases} y \geq 0 \\ x \geq -1 \dots \text{Answer} \\ y \leq -x \end{cases}$$

Simultaneous linear inequalities in two variables

2012-18.

- (i) $x \geq 1$
- (ii) $y \geq 0$
- (iii) $(0,3), (3,0)$

This line passes through $(0,3), (3,0)$

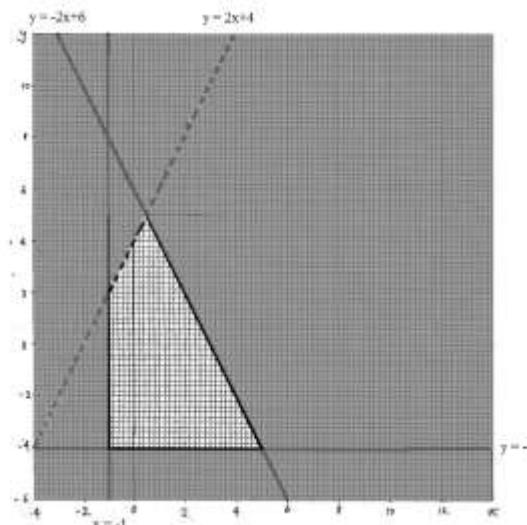
$$\text{So, gradient} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-3}{3} = -1$$

$$y = mx + c$$

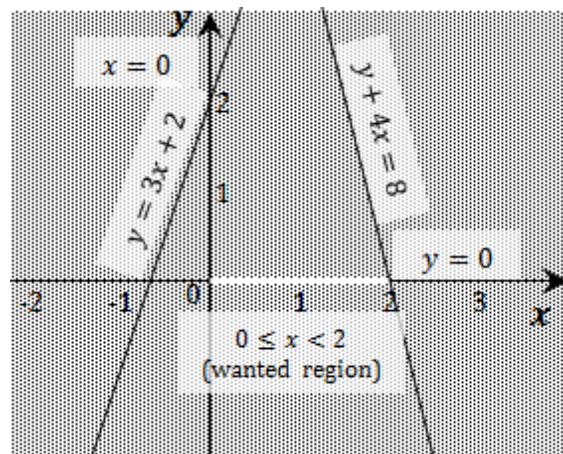
$$y = -x + 3$$

$$\therefore \begin{cases} x \geq 1 \\ y \geq 0 \\ y < -x + 3 \text{ (or } x + y < 3) \end{cases} \dots \text{Answer}$$

2011-18.



2010-19.



2007-20.

From graph,

$$\begin{cases} y \geq 0 \\ y \leq 4 - 2x \\ y \leq x \end{cases} \dots \text{Answer}$$

“ $x \geq 0$ ” is unnecessary. Because , in this question , “Write the 3 inequalities” is written.

2005-14.

Chikins = hens + cocks

Now, let hens be x , and let cocks be y .

$$\therefore \begin{cases} x + y \leq 70 \\ 0 \leq x < 30 \\ 0 \leq y \leq 70 \end{cases} \dots \text{Answer}$$

Linear programming**2007-17.**

Let the maximum value of $5x - 4y + 8$ to be C_{max}

$$\leftrightarrow 5x - 4y + 8 = C_{max}$$

$$\leftrightarrow 4y = 5x + 8 - C_{max}$$

$$\leftrightarrow y = \frac{5}{4}x + \frac{1}{4}(8 - C_{max})$$

The y – intercept of this line is $\frac{1}{4}(8 - C_{max})$.

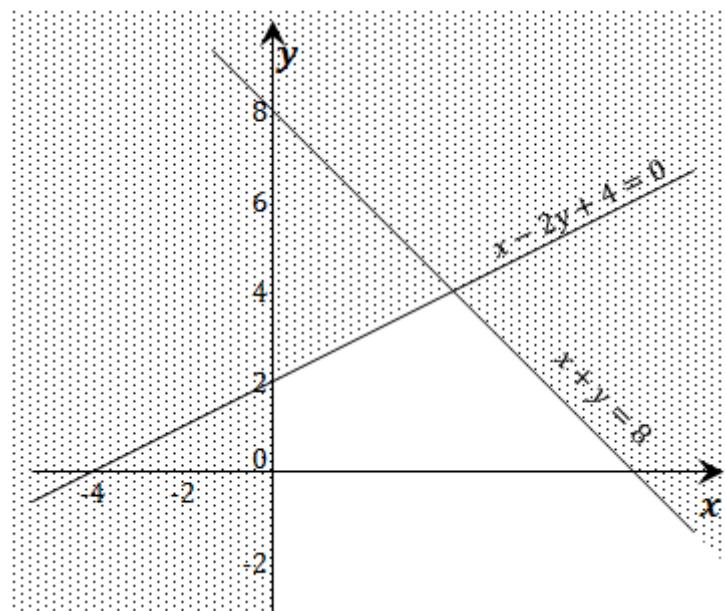
When the value of $\frac{1}{4}(8 - C_{max})$ is minimum , C_{max} is maximum .

This line has a positive gradient.

So , when this line passes through the point (4 , 1) , it gets the maximum value.

Therefore, when $x = 4$, $y = 1$,

$$5 \times 4 - 4 \times 1 + 8 = 24 \dots \text{Answer}$$

2006-18.

2003-18.

(i) Make a scale of 2 cm to represent 1 units on the x-axis and y-axis

(ii) Make y the subject for $x + y < 2$.

$$x + y < 2$$

$$y < -x + 2$$

(iii) Draw the three graphs for $x = -1$, $y = -2$, $y = -x + 2$

*Use the dot-line to draw them in order to show that the answer is excluding the values on the lines.

(iv) Fill the area for the following condition.

$$x > -1 \quad (\text{Right side of } x = -1)$$

$$y > -2 \quad (\text{Above } y = -2)$$

$$y < -x + 2 \quad (\text{Under } y = -x + 2)$$

