REVISION: LINEAR PROGRAMMING

NAME		DATE	
CLASS		TEACHER	**MR EMAN**

ANSWER ALL QUESTIONS. PROVIDE NECESSARY WORKING.

1. Which of the following points are **NOT** solutions of $2x - y \geq 1$?

P (1, -10) R (0, 0) S (-10, 1) T (1, 1)

Answer: ..... [2]

2. Which of the points are **solutions** of both inequalities: $y \geq 1 - x$ and $y < \frac{2}{3}x + 6$?

A (0, 6) B (1, 0) C (–3, 4) D (4, 3)

Answer: ..... [2]

3. Shown below is the graph of a system of 2 inequalities **with true values being shaded**.
From the list, choose which two inequalities describe the graph.

$x \leq 2$

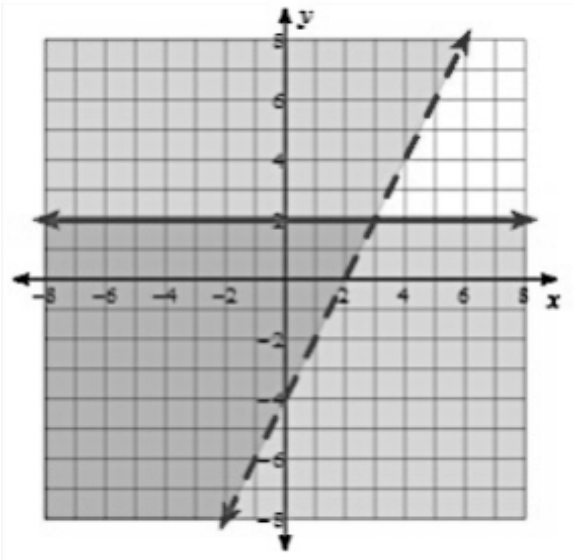
$y \leq 2$

$y < 2x - 4$

$y - 2x > -4$

$y < -4x + 2$

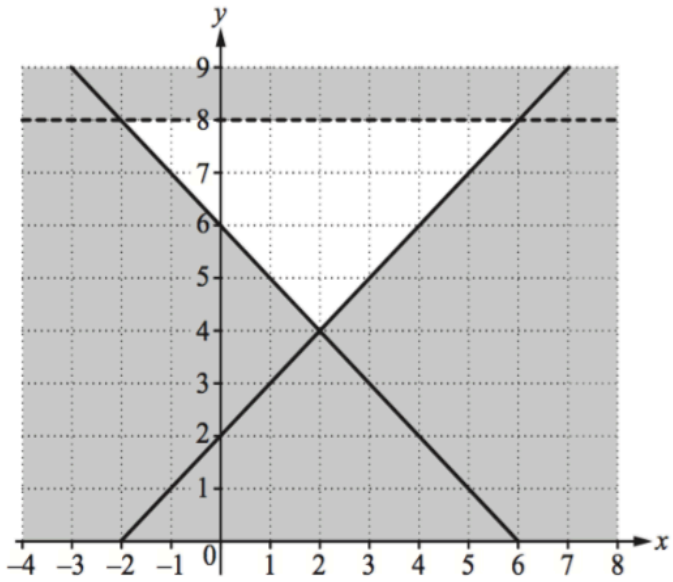
$y < -2x - 4$



Answers: ..... [1]

..... [1]

4. (a) Given the figure below, write down the 3 inequalities which define the **unshaded** region.



Answers: .....

.....

..... [3]

Using integer values of x and y,

(b) find the point that gives:

(i) the maximum value of $2x + 3y$

Answer: ..... [2]

(ii) the minimum value of $3x + 2y$

Answer: ..... [2]

(c) find the minimum value of $-2x + y$

Answer: ..... [2]

5. Draw the graphs of the following system of inequalities by **shading the unwanted.**

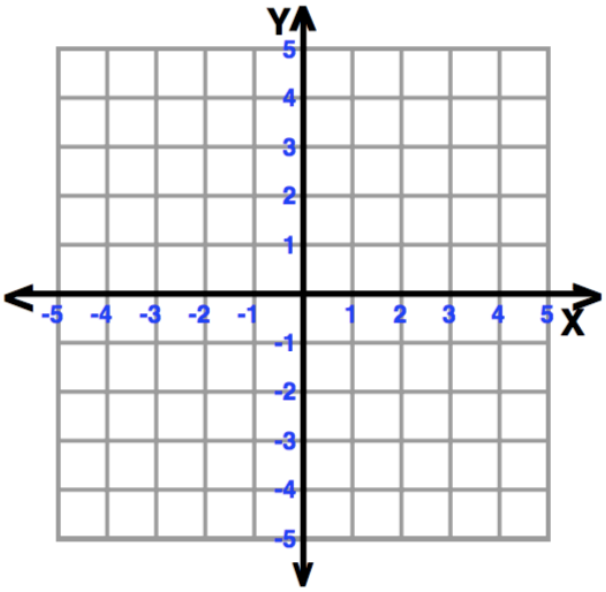
$y > x$ $\quad 2x + y \leq 30$ $\quad x + y \geq 8$ $\quad y < 12$

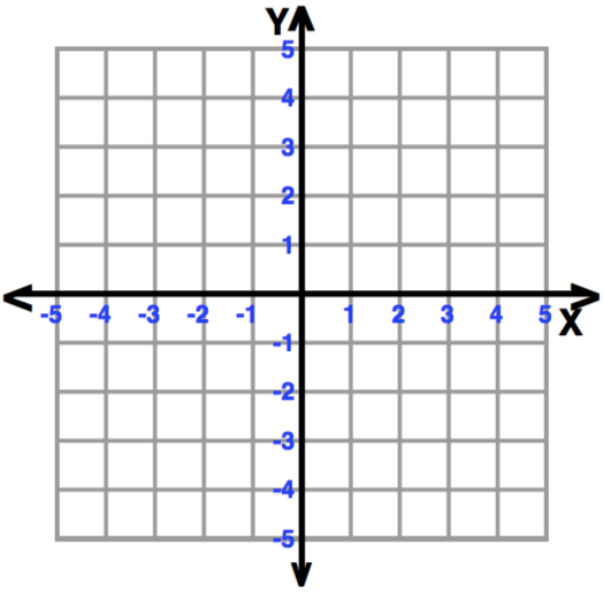
Use 2 cm to represent 2 units on x-axis and 5 units on y-axis.
Mark the region of solutions with **R**.

[4]

6. For each inequality listed below, construct it graph. Show your test point.
Shade the region where all solutions are found.

(a) $y > 3x - 2$ (b) $3x - 2y \geq 6$ [6]





7. A farmer needs to buy up to 25 cows for a new herd.
He can buy either brown cows (x) at \$50 each or black cows (y) at \$80 each and he can spend a total of no more than \$1600.
He must have at least 9 of each type.

(a) Write down **four inequalities** that describe the conditions given above.

Answers: .....

.....

.... [3]

(b) Using 2 cm to represent 5 units on x-axis and using 4 cm to represent 5 units on y-axis, show the graphs of the inequalities in **part (a)**.

[4]

(c) (i) On selling the cows he makes a profit of \$50 on each brown cow and \$60 on each black cow.
Write an algebraic expression that describes the total profit he makes from selling the cows.

Answer: ..... [1]

(ii) How many of each type of cow must he buy for maximum profit?

Answer: ..... [2]

8. Eli plans to exhibit frozen yoghurt at a trade fair.
He will take two types of frozen yoghurt, **Banana Blast** and **Strawberry Scream.**

Let x be the number of litres of **Banana Blast**, and y be the number of litres of **Strawberry Scream**.

(a) (i) He will take a total of at least 20 litres of yoghurt.
Write down an inequality to represent this condition.

Answer: …… [1]

(ii) He wants at least 25% of the yoghurt to be **Banana Blast.**
Write down an inequality to represent this condition **in simplest form**.

Answer: …… [2]

(iii) He also wants that there will be at most half as much **Banana Blast** as **Strawberry Scream**.
Write down an inequality to represent this condition **in simplest form**.

Answer: …… [2]

(iv) Each litre of **Banana Blast** costs \$6 to produce and each litre of **Strawberry Scream** costs \$4 to produce.
Eli has up to \$100 budget to produce the yoghurts.
Write this condition as an algebraic inequality **in simplest form**.

Answer: …… [2]

(b) Using appropriate pair of axes, show the graphs of the inequalities in **part (a)**.

[4]

(c) He plans to sell the **Banana Blast** yoghurts at \$9.75 each and the **Strawberry Scream** at 7.50 each.
(i) Find the most number of yoghurts that he can bring to the trade fair to get the most profit possible.

Answer: …… [3]

(ii) Find out the largest possible profit he can get.

Answer: …… [1]