$$f(x) = |3x+2|, \ x \in \mathbb{R}.$$

a) Sketch the graph of $f(x)$, clearly indicating the coordinates of any points where the graph of $f(x)$ meets the coordinate axes.

b) Solve the equation

$$f(x) = 1.$$

$\boxed{}$, $\boxed{(0,2),\left(-\frac{2}{3},0\right)}$, $\boxed{x = -\frac{1}{3}, -1}$

The functions f and g are defined as

$$f(x) = |2x-4|, \ x \in \mathbb{R}$$

$$g(x) = |x|, \ x \in \mathbb{R}.$$

a) Sketch in the same diagram the graph of f and the graph of g.

Mark clearly in the sketch the coordinates of any x or y intercepts.

b) Solve the equation

$$f(x) = g(x).$$

c) Hence, or otherwise, solve the inequality

$$f(x) < g(x).$$

$\boxed{(0,0),(2,0),(0,4)}$, $\boxed{x = \frac{4}{3}, 4}$, $\boxed{\frac{4}{3} < x < 4}$

Question 11 (***)

Solve the modulus inequality

$$12 - 2|2x - 3| \geq 7.$$

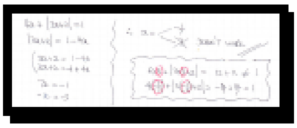
$\boxed{\frac{1}{4} \leq x \leq \frac{11}{4}}$

Question 12 (***)

Solve the modulus equation

$$4x + |3x + 2| = 1.$$

, $\boxed{x = -\frac{1}{7}}$



Question 13 (***)

Find the solutions of the equation

$$|2x^2 - 5| = 13.$$

$\boxed{x = \pm 3}$

The curve C_1 and the curve C_2 have respective equations

$$y = |x| \quad \text{and} \quad y = |x - 2| + 1.$$

a) Sketch the graph of C_2, indicating the coordinates of any intercepts with the coordinate axes.

b) Determine the coordinates of the point of intersection between the graph of C_1 and the graph of C_2.

$\boxed{\left(\frac{3}{2}, \frac{3}{2}\right)}$

Question 53 (****)

The straight line L with equation

$$y = x + 3, \; x \in \mathbb{R},$$

intersects the curve C with equation

$$y = \left| x^2 - 9 \right|, \; x \in \mathbb{R},$$

at three distinct points.

a) Sketch on the same set of axes the graph of L and the graph of C.
The sketch must include the coordinates of any x or y intercepts.

b) Find the coordinates of the points of intersections between L and C.

$\boxed{(-3,0), \; (3,0), \; (0,3), \; (0,9)}$, $\boxed{(-3,0), \; (2,5), \; (4,7)}$