## (5) Modulus and Graph of Logarithms/Exponentials Functions

1. Sketch the graph $y = e^{x+2}$. State the equation of a straight line that can be drawn to solve the equation $x + 2 = \ln(x + 1) - \ln 2$.

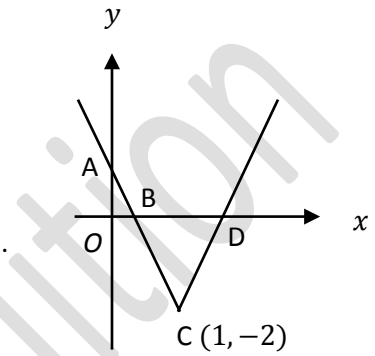
2. The figure shows part of the graph of $y = |ax - 4| + b$ where $C(1, -2)$ is the minimum point of the graph.

   i) State the value of $b$

   ii) Find the value of $a$

   iii) Find the coordinates of $A$, $B$ and $D$.

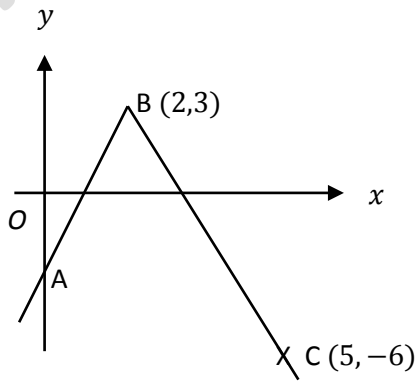
   iv) Write down the range of values of $x$ for which $y$ is negative.




3. The diagram show part of the graph of $y = a - |bx + c|$ where $b > 0$. Given that it passes through the points $B(2,3)$ and $C(5, -6)$,

   i) Find the values of $a$, $b$ and $c$

   ii) Find the $x$-intercepts and the $y$-intercept of the graph.




4. Sketch the graph $y = 3\ln(x + 1)$. On the same graph, add a suitable straight line which will help solve the equation $(x + 1)e^{\frac{1}{3}x+1} = e^2$. State the equation of the straight line.

5. Solve the equation $|-3x + 21| = 8x + |x - 7|$

6. i) On the same diagram, sketch the graphs of $y = |2x|$ and $y = |x + 3|$.

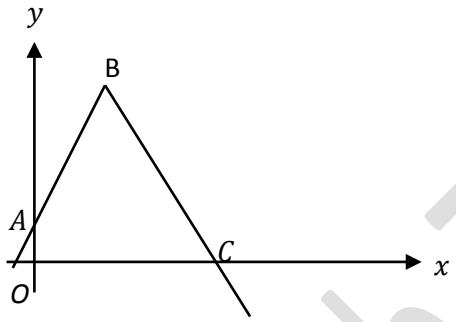
   ii) State the number of solutions of the equation for $|2x| = |x + 3|$.

   iii) Find the coordinates of the intersection points of the 2 graphs.

   iv) Hence, state the solution of $|2x| > |x + 3|$.

7. a) Solve the equation $|x - 2| = 2 - 4x$

   b) The diagram shows part of the graph of $y = 4 - |2x - 3|$. Find the coordinates of $A, B \text{ and } C$.




8. $|2x^2 + 4x - 11| > 5$

9. i) Sketch the graph $y = |x^2 - 2x|$indicating the intercepts and coordinates of the turning point.

   ii) In each of the following case, determine the number of solutions of the equation $|x^2 - 2x| = mx + c$ where $0 < c < 1$, justify your answer.
   a) $m = 0$
   b) $m = -1$

10. i) Sketch the graph of $y = |3x - 2|$ for $-1 < x < 2$.

    ii) State the corresponding range of $y$.

    iii) Find the range of values of $c$ for which $|3x - 2| = 3x + c$ has only one solution for $-1 < x < 3$.