

Graphing with Absolute Values

Past Examination Questions

Part 2

1. Draw, on graph paper, the graph of $y = 1 - \left|x - \frac{3}{2}\right|$ for $0 \leq x \leq 3$. (N93/P1/17b)
2. Solve the simultaneous equations $3x - 2y = 13$, $|x + y| = 1$. (J94/P1/16c)
3. Solve the equation $|2x - 3| = 3x$. (N94/P1/11c)
4. Draw on graph paper the graph of $y = |5 - 3x| + 2$ for $0 \leq x \leq 4$. Find the range of values of x for which (i) $y \leq 4$, (ii) $y \leq 3$. (J95/P1/17b)
5. Using graph paper, draw, on the same diagram, the graphs of $y = 2 - |x - 2|$, $y = \frac{1}{2}x + 2$, for $-1 \leq x \leq 5$. How many pairs of values, (x, y) satisfy both equations? (N95/P1/10)
6. Find the distance between the two points of intersection of the graphs of $y = |x - 1|$ and $y = -\frac{1}{2}x + 5$. (N96/P1/12a)
7. Sketch the graphs of $3y = 4x + 2$ and $3y = |4x - 8|$ on the same diagram. Solve the simultaneous equations $3y = 4x + 2$, $3y = |4x - 8|$. (N97/P1/17b)
8. Using graph paper, draw accurately on the same diagram, for $-3 \leq x \leq 3$, the graphs of $2y = |x - 2|$ and $y = x + |2x|$. On each axis use 2 cm to represent one unit. Hence, or otherwise, solve the equation $\frac{x-2}{2} = x + |2x|$. (J98/P1/16b)
9. Sketch the graph of $y = 3 - |3 - 2x|$ for $-1 \leq x \leq 4$ and state the values of x for which $y > 1$. (J99/P1/17b)
10. Draw on graph paper, using a scale of 2 cm for 1 unit on each axis, the graph of $y = |5 - 2x| - 2$, for $0 \leq x \leq 5$. Find the range of values of x for which (a) y is negative, (b) $|y| \leq 1$. (J2000/P1/16b)
11. (i) Sketch, on the same diagram, the graphs of $y = |x| + 1$ and $y = |2x - 3|$.
(ii) State the number of solutions of the equation $|2x - 3| = |x| + 1$. (J2002/P2/2)
12. (i) Sketch the graph of $y = \ln x$.
(ii) Determine the equation of the straight line which would need to be drawn on the graph of $y = \ln x$ in order to obtain a graphical solution of the equation $x^2 e^{x-2} = 1$. (N2002/P2/8)

2. $x=3, y=-2; x=2\frac{1}{5}, y=-3\frac{1}{5}$

3. $\frac{3}{5}$

4. (i) $2\frac{1}{3} \geq x \geq 1$

(ii) $2 \geq x \geq 1\frac{1}{3}$

5. None

6. 13.4 units

7. $x=\frac{3}{4}, y=1\frac{2}{3}$

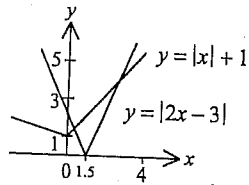
8. $-2, \frac{2}{7}$

9. $2\frac{1}{2} > x > \frac{1}{2}$

10. (i) $1.5 < x < 3.5$

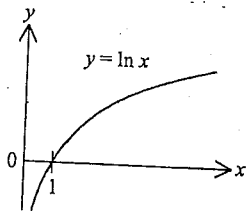
(ii) $1 \leq x \leq 4$

11. 2. (i)



(ii) Two solutions

12. (i)



(ii) $y = \frac{2-x}{2}$