

## A Level Mathematics Year 2 Exam Questions by Topic Chapter 4: The modulus function

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These questions are taken from the Specimen Exam materials and the real 2018 papers for the new syllabus AS and A-level mathematics courses and arranged by chapter of the textbooks by Goldie et al (available here: <https://amzn.to/39umfr5> and <https://amzn.to/3hE8kBL> ). There are a mixture of questions from OCR A, OCR B (MEI), Edexcel and AQA. Although the style of questions varies a little across the exam boards the content of the syllabus is almost identical so these are suitable for students preparing for any exam board.

Free problem sets for all other chapters, as well as video solutions, full past papers and other content for GCSE and A-level maths can be found at:

<https://mathsaurus.com/>

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### OCR A Sample Paper 3 Question 1:

- 1 (i) If  $|x|=3$ , find the possible values of  $|2x-1|$ . [3]
- (ii) Find the set of values of  $x$  for which  $|2x-1|>x+1$ . Give your answer in set notation. [4]
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### OCR B MEI 2018 Paper 2 Question 2:

- 2 Solve the inequality  $|2x+1|<5$ . [3]
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### OCR B MEI Sample Paper 1 Question 3:

- 3 Solve the inequality  $|2x-1|\geq 4$ . [4]
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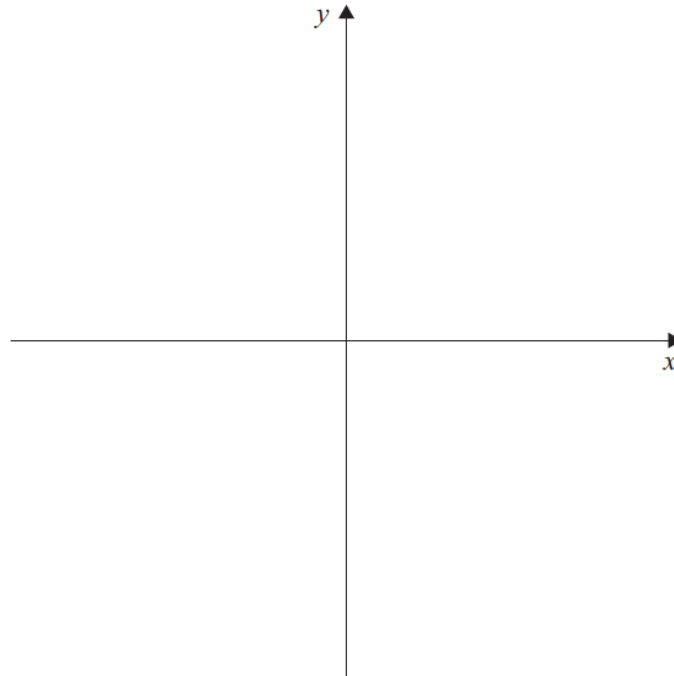
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AQA 2018 Paper 3 Question 4:

4 Sketch the graph of  $y = |2x + a|$ , where  $a$  is a positive constant.

Show clearly where the graph intersects the axes.

[3 marks]



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Edexcel 2018 Paper 2 Question 3:

3. (a) “If  $m$  and  $n$  are irrational numbers, where  $m \neq n$ , then  $mn$  is also irrational.”

**Disprove** this statement by means of a counter example.

(2)

(b) (i) Sketch the graph of  $y = |x| + 3$

(ii) Explain why  $|x| + 3 \geq |x + 3|$  for all real values of  $x$ .

(3)

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Edexcel Sample Paper 2 Question 11:

11.

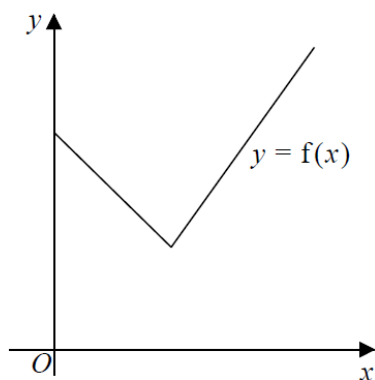


Figure 2

Figure 2 shows a sketch of part of the graph  $y = f(x)$ , where

$$f(x) = 2|3 - x| + 5, \quad x \geq 0$$

(a) State the range of  $f$

(1)

(b) Solve the equation

$$f(x) = \frac{1}{2}x + 30$$

(3)

Given that the equation  $f(x) = k$ , where  $k$  is a constant, has two distinct roots,

(c) state the set of possible values for  $k$ .

(2)

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OCR A 2018 Paper 3 Question 2:

2 Solve the equation  $|2x - 1| = |x + 3|$ .

[3]