Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

STEM | Exam Builder

Equations, inequalities and graphs

Time allowed: 1 hour 10 minutes

Subject code **0606**

Additional Mathematics

Questions from Paper 1 and Paper 2

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
Questions 2-3, 7 (Paper 1): no calculator.
Questions 1, 4-6, 8-10 (Paper 2): calculator allowed.

Total marks

/ 44

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 44 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

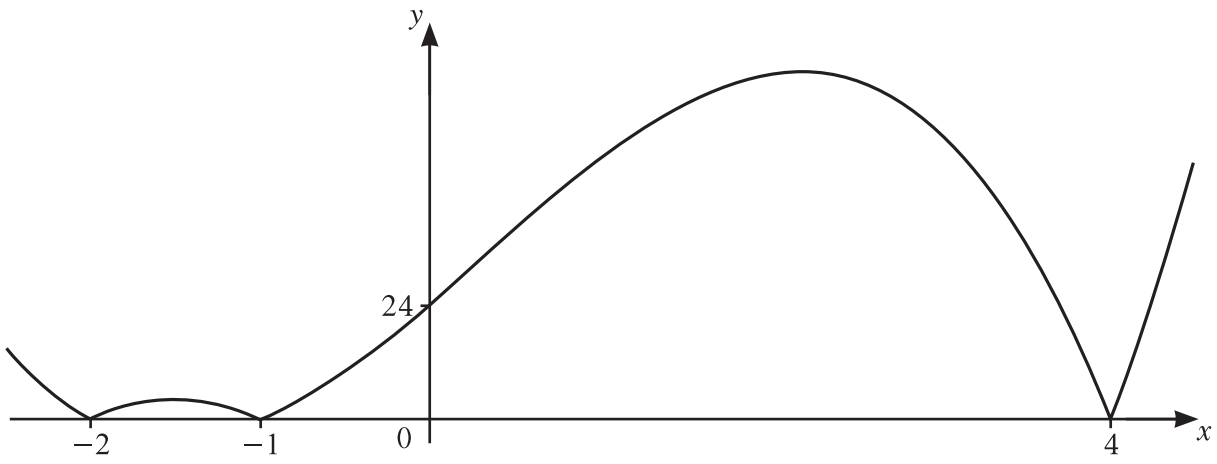
STEM | Exam Builder

Print at 100% (Actual size) so diagrams keep their real measurements.

1 Solve $|3x+2| = x+4$. [3]

Modulus equations and inequalities Click for more variations

2



The diagram shows the graph of $y = |\mathrm{p}(x)|$, where $\mathrm{p}(x)$ is a cubic function. Find the two possible expressions for $\mathrm{p}(x)$. [3]

Cubic graphs and cubic inequalities Click for more variations

STEM | Exam Builder

3 Solve the equation $x^{\frac{1}{3}} + 1 = \frac{6}{x^{\frac{1}{3}}}$. [4]

STEM | Exam Builder

Equations that become quadratics (substitution) Click for more variations

4 Solve the equation $|7x + 5| = |3x - 13|$. [4]

Modulus equations and inequalities Click for more variations

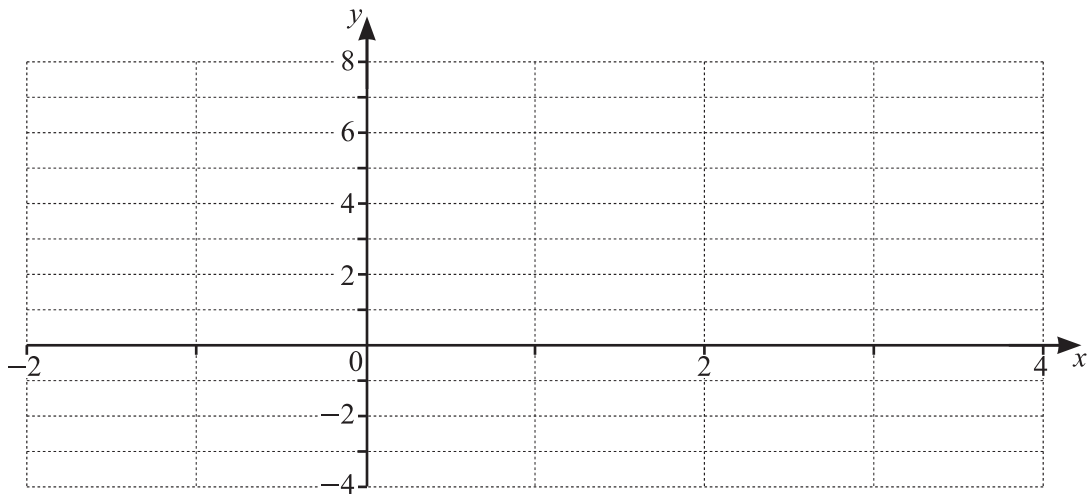
STEM | Exam Builder

5 Solve the inequality $|5x+2| \geqslant 3$. [4]

STEM | Exam Builder

Modulus equations and inequalities Click for more variations

6 **(i)** On the axes below, draw the graph of $y = |2x - 3|$.



[2]

(ii) Solve the equation $7 - |2x - 3| = 0$. [3]

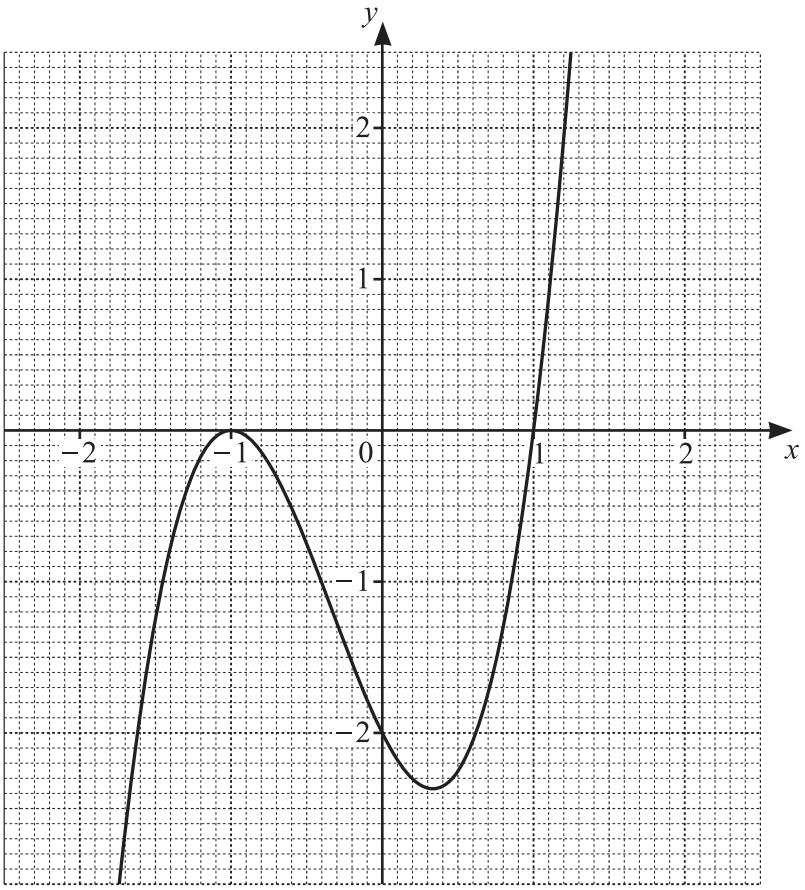
Modulus equations and inequalities Click for more variations

7 Solve the equation $|x^2 - 5x| = 6$. [5]

STEM | Exam Builder

Modulus equations and inequalities Click for more variations

8



The diagram shows the graph of $y = \mathrm{f}(x)$, where $\mathrm{f}(x) = a(x+b)^2(x+c)$ and a, b and c are integers.

(a) Find the value of each of a, b and c. [2]

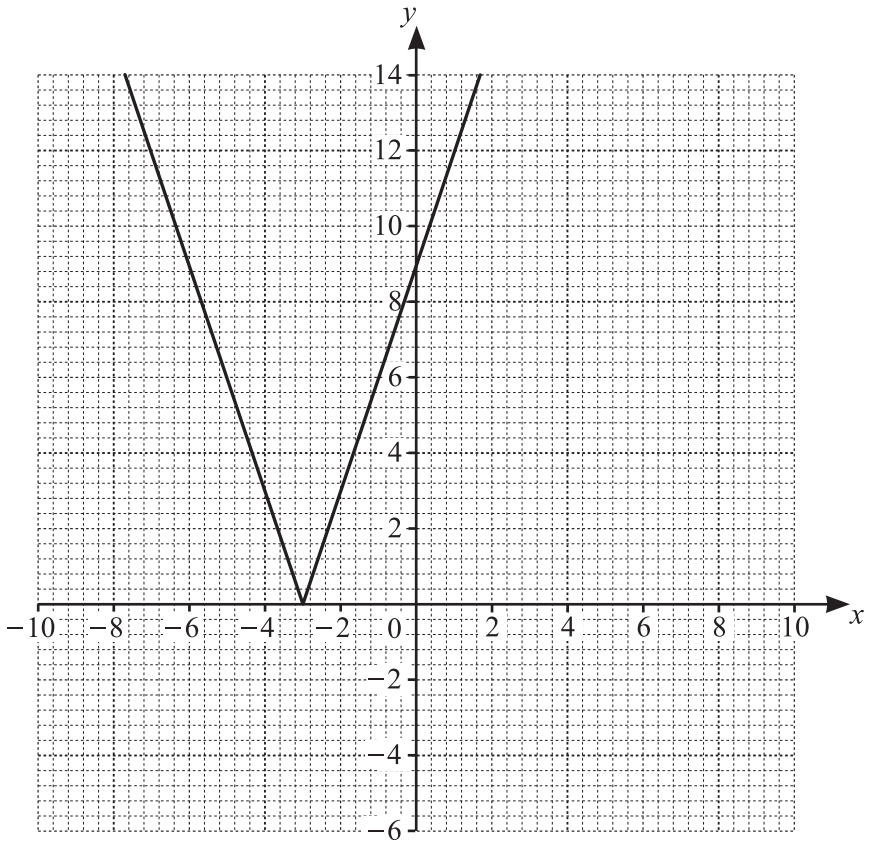
(b) Hence solve the inequality $\mathrm{f}(x) \leqslant -1$. [3]

STEM | Exam Builder

Cubic graphs and cubic inequalities Click for more variations

9 **(a)** Solve the equation $\frac{|4x-5|}{7} = 1$. [2]

(b)



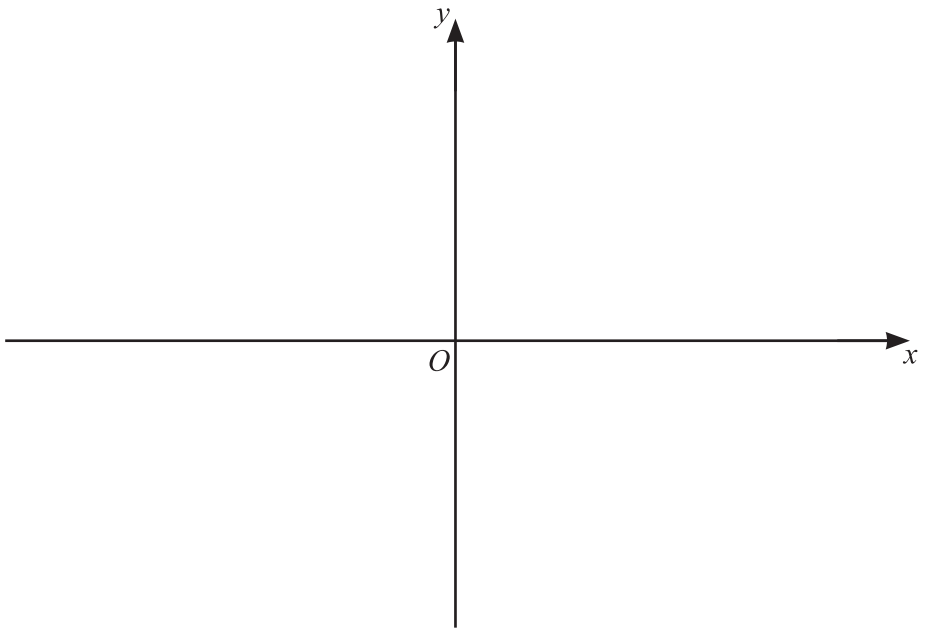
The diagram shows the graph of $y = |3x+9|$.

By drawing a suitable graph on the same diagram, solve the inequality $|3x+9| \leqslant |x-5|$. [3]

STEM | Exam Builder

Modulus equations and inequalities Click for more variations

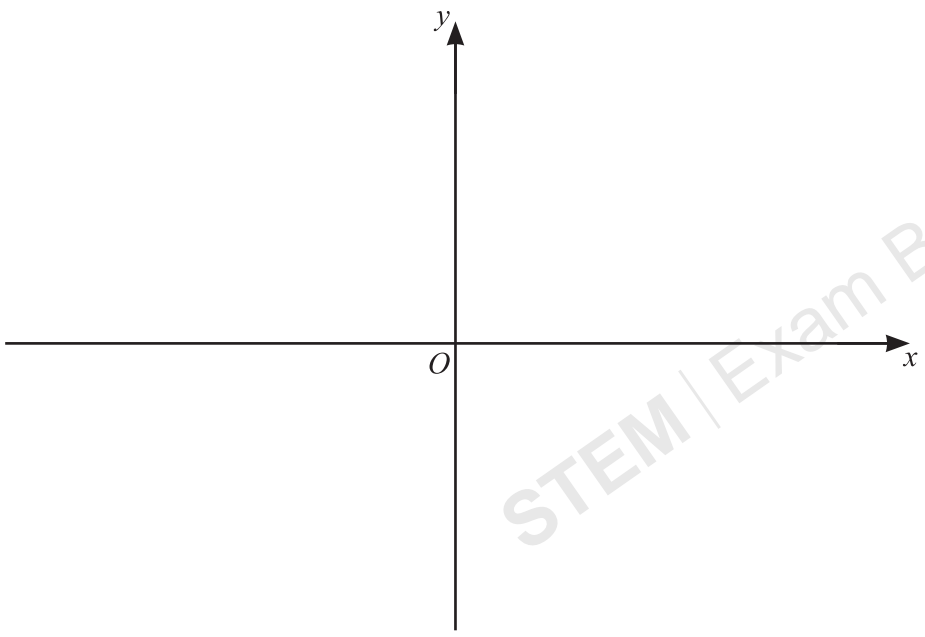
10 **(a)** On the axes, sketch the graph of $y = (2x-5)(x+3)(1-x)$, stating the intercepts with the coordinate axes. [3]



(b) Hence

(i) solve the inequality $(2x-5)(x+3)(1-x) \leqslant 0$ [2]

(ii) on the axes below, sketch the graph of $y = |(2x-5)(x+3)(1-x)|$. [1]



STEM | Exam Builder

Cubic graphs and cubic inequalities Click for more variations