11 Given that for all values of x,

$$(3x - 2)(x^3 - 3x^2 + 3) = 3x^4 + ax^3 + 6x^2 + 9x - 6$$

(a) show that $a = -11$

(2)

(b) Find the coordinates of the stationary points on the curve with equation $y = x^3 - 3x^2 + 3$

(4)

(c) Complete the following table of values for $y = x^3 - 3x^2 + 3$

x	-1	0	1	1.5	2	2.5	2.75	3
y	-1		1					3

(3)

(d) On the grid opposite, plot the points from your completed table and plot the stationary points from part (b) and join them to form a smooth curve.

(3)

(e) Use your graph to write down estimates, to 2 decimal places, of the solutions of the equation $3x^4 - 11x^3 + 6x^2 + 9x - 6 = 0$

(4)

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Question 11 continued

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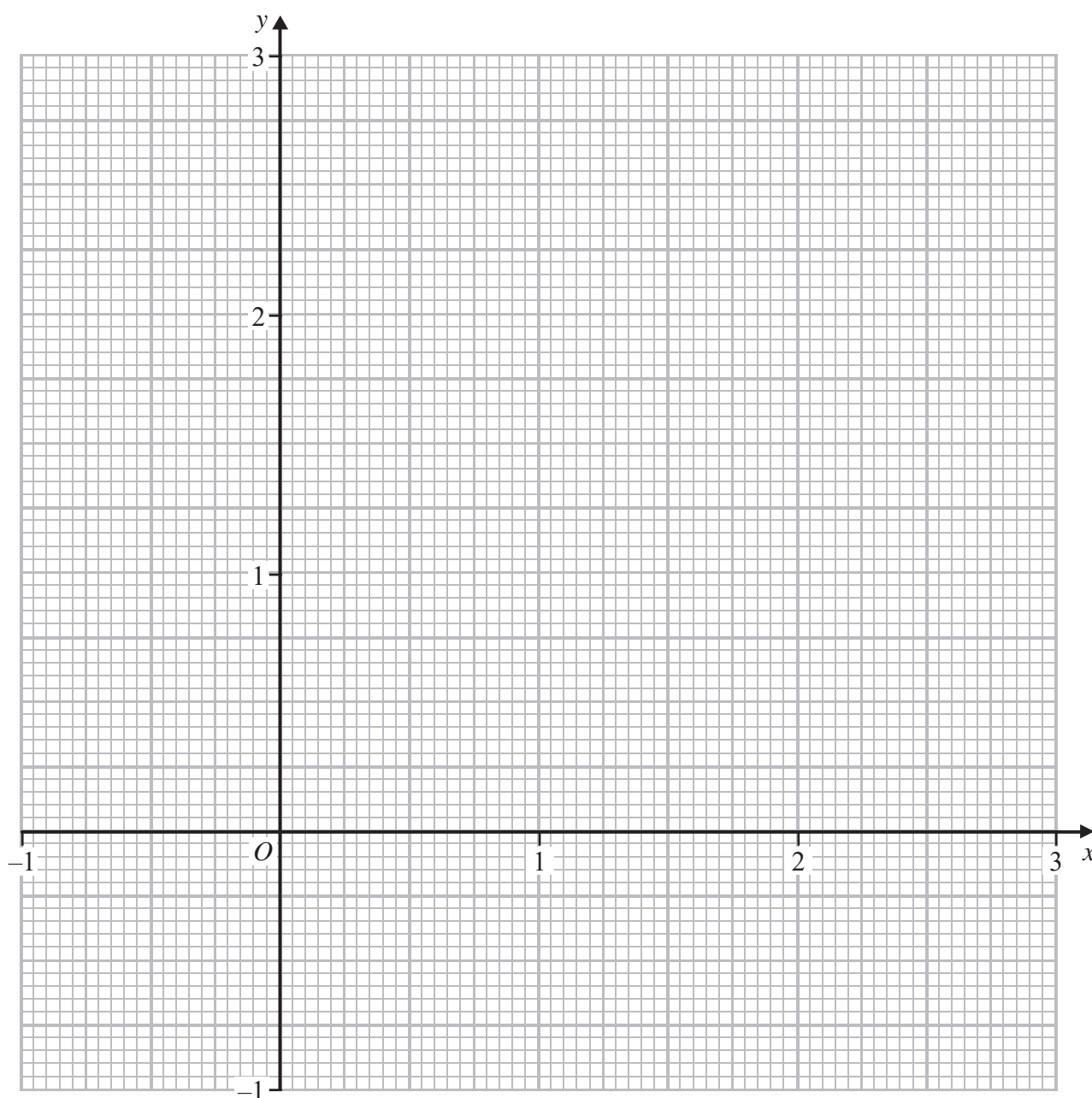
Turn over for a spare grid if you need to redraw your curve.

Question 11 continued

Question 11 continued

Only use this grid if you need to redraw your curve.
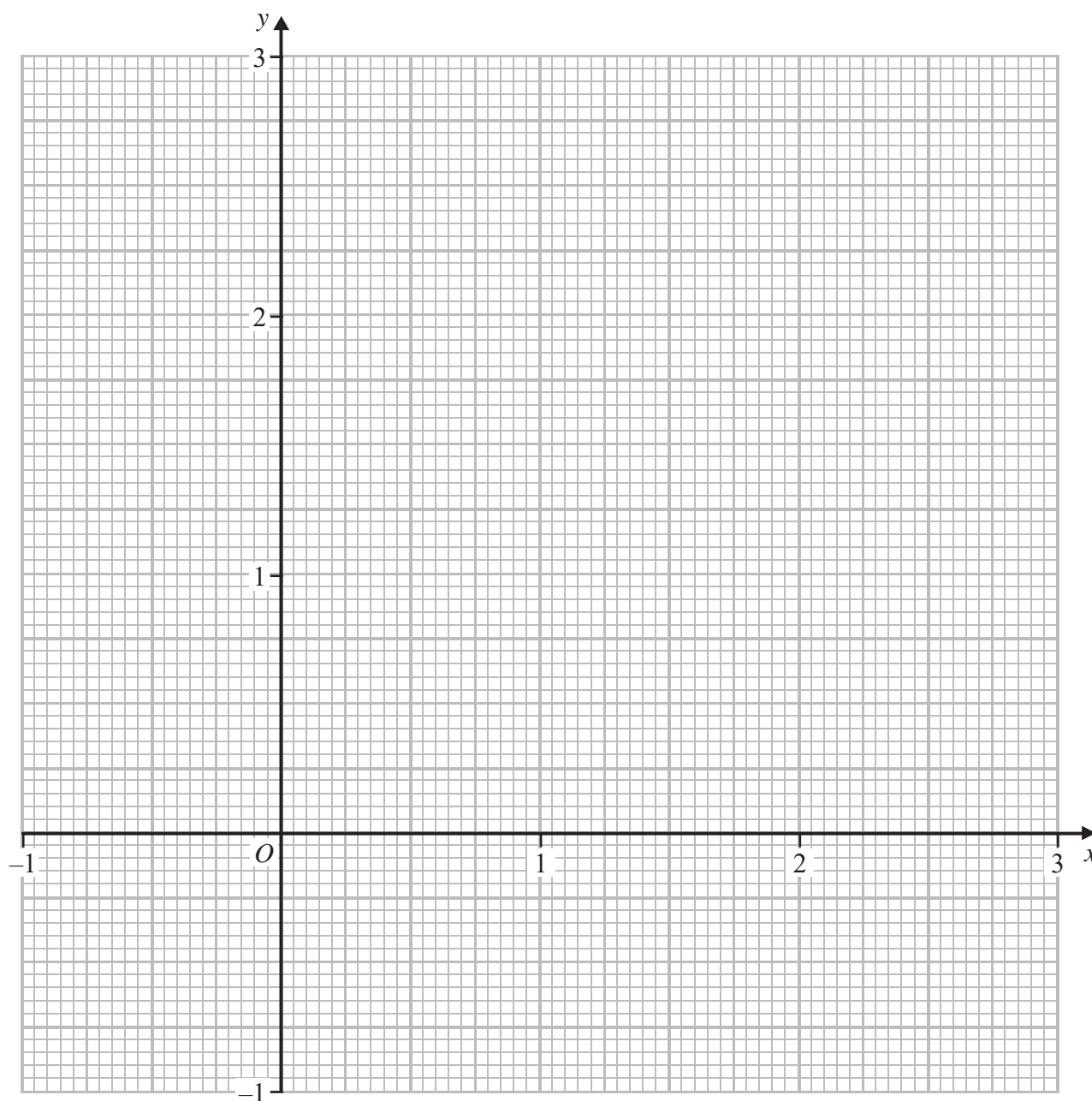
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Question 11 continued

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(Total for Question 11 is 16 marks)

TOTAL FOR PAPER IS 100 MARKS

P 5 3 3 0 9 A 0 3 2 3 2