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- 8 The variables *x* and *y* are connected by the equation

$$y = 1 + 2x^2 - x^3$$
.

The table below shows some values of x, and the corresponding values of y, correct to 1 decimal place where appropriate.

x	-1	-0.5	0	0.5	1	1.5	2	2.5
у	4	1.6	1	1.4	2	2.1	1	р

(a) Calculate *p*.

Give your answer correct to 1 decimal place.

- Answer $p = \dots [1]$
- (b) On the graph paper opposite, using a scale of 2 cm to represent 1 unit on both axes, draw a horizontal x-axis for -2 ≤ x ≤ 3, and draw a vertical y-axis for -3 ≤ y ≤ 5. On your axes, plot the points given in the table and join them with a smooth curve. [3]
- (c) Use your graph to find all the solutions of $1 + 2x^2 x^3 = 2$.

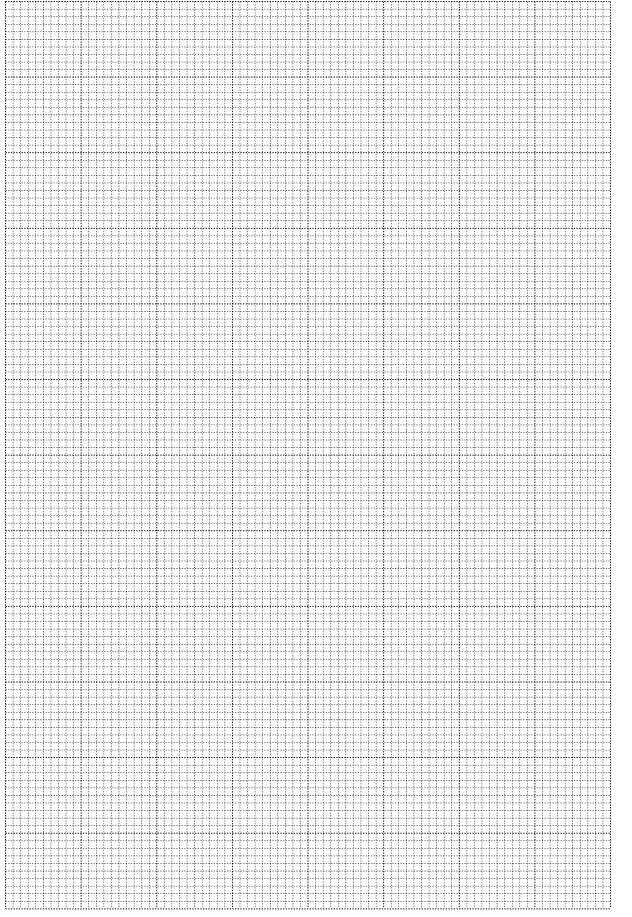
Answer $x = \dots [2]$

(d) By drawing a tangent, find the gradient of the curve at the point where x = -0.5.

(e) By drawing an appropriate straight line on the grid, solve the equation $1 + 2x^2 - x^3 = x$.

(f) Find the range of values of k such that $1 + 2x^2 - x^3 = k$ has 3 solutions.

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