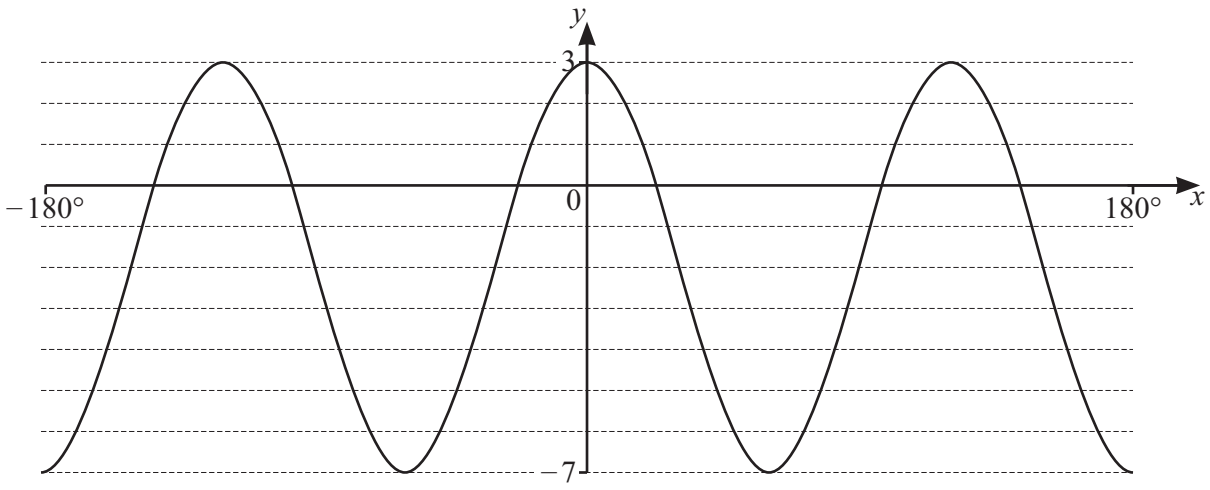
2



The diagram shows the curve $y = a\cos bx + c$ for $-180° \leqslant x \leqslant 180°$.
It is given that a, b and c are integers.

Find the values of a, b and c. [3]

3 The point A has coordinates $(-3, 6)$.
The point B has coordinates $(7, -8)$.

Given that the line AB is the diameter of a circle, find the equation of the circle. [4]

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4 The polynomial p is given by $\mathrm{p}(x) = a^2x^3 + 2ax^2 + ax + 2$, where a is a positive integer. It is given that $2x + 1$ is a factor of $\mathrm{p}(x)$.

(a) Find the value of a. [3]

(b) Hence factorise $\mathrm{p}(x)$. [2]

(c) Hence show that the equation $\mathrm{p}(x) = 0$ has only one real root. [1]