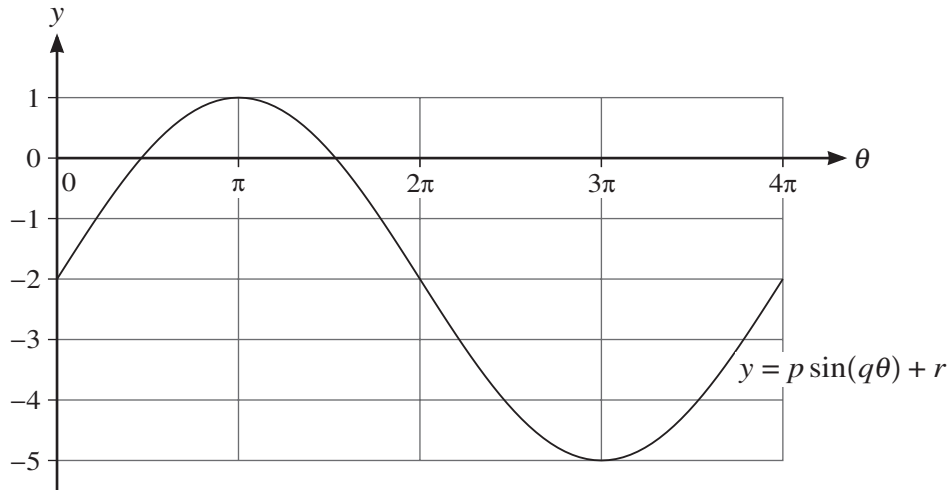


2



The diagram shows part of the curve with equation $y = p \sin(q\theta) + r$, where p , q and r are constants.

(a) State the value of p . [1]

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(b) State the value of q . [1]

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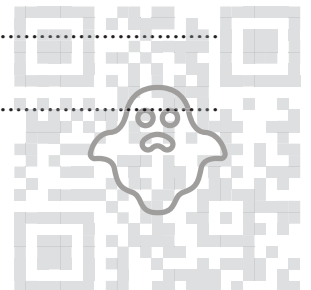
(c) State the value of r . [1]

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3 An arithmetic progression has first term 4 and common difference d . The sum of the first n terms of the progression is 5863.

(a) Show that $(n - 1)d = \frac{11726}{n} - 8$. [1]

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(b) Given that the n th term is 139, find the values of n and d , giving the value of d as a fraction. [4]

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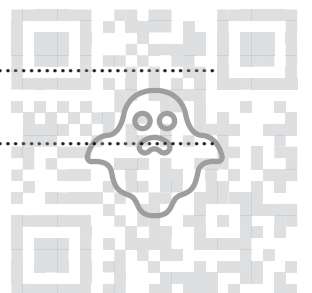
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5 (a) Solve the equation $6\sqrt{y} + \frac{2}{\sqrt{y}} - 7 = 0$. [4]

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(b) Hence solve the equation $6\sqrt{\tan x} + \frac{2}{\sqrt{\tan x}} - 7 = 0$ for $0^\circ \leq x \leq 360^\circ$. [3]

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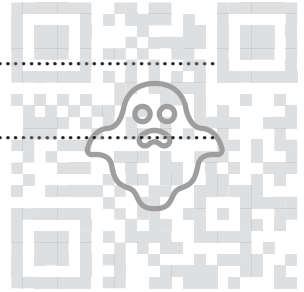
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6 The function f is defined by $f(x) = 2x^2 - 16x + 23$ for $x < 3$.

(a) Express $f(x)$ in the form $2(x + a)^2 + b$. [2]

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(b) Find the range of f . [1]

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(c) Find an expression for $f^{-1}(x)$. [3]

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The function g is defined by $g(x) = 2x + 4$ for $x < -1$.

(d) Find and simplify an expression for $fg(x)$. [2]

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