October 2
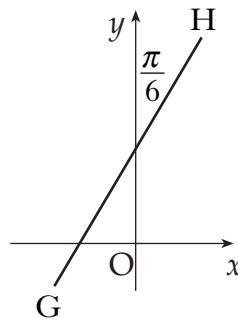
1. What is the distance, in units, between the points $(-1, 2)$ and $(4, 5)$?

    A. $\sqrt{8}$

    B. $\sqrt{16}$

    C. $\sqrt{34}$

    D. $\sqrt{58}$ 2

2. The line GH makes an angle of $\frac{\pi}{6}$ radians with the y-axis, as shown in the diagram.

    What is the gradient of GH?

    A. $\sqrt{3}$

    B. $\frac{1}{2}$

    C. $\frac{1}{\sqrt{2}}$

    D. $\frac{\sqrt{3}}{2}$ 2
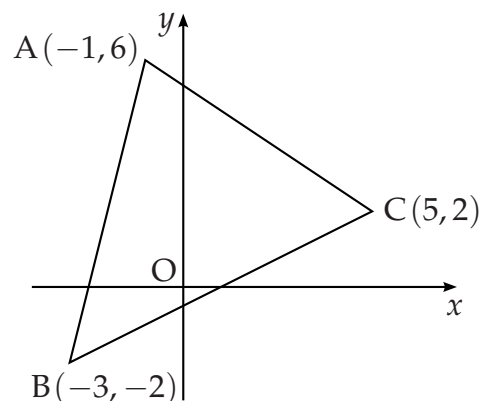
3. Find the exact values of x in the interval $0 \le x \le 2\pi$ for which $3\tan^2 x = 1$.   3

[SQA]
4. Triangle ABC has vertices $A(-1, 6)$, $B(-3, -2)$ and $C(5, 2)$.

    Find

    (a) the equation of the line p, the median from C of triangle ABC.   3

    (b) the equation of the line q, the perpendicular bisector of BC.   4

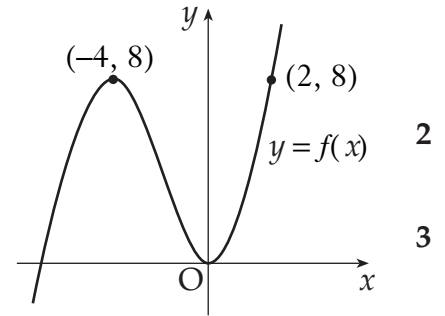   (c) the coordinates of the point of intersection of the lines p and q.   1

5. The diagram shows a sketch of the function $y = f(x)$.

    (a) Copy the diagram and on it sketch the graph of $y = f(2x)$. **2**

    (b) On a separate diagram sketch the graph of $y = 1 - f(2x)$. **3**

6. Functions f and g are defined on suitable domains by $f(x) = x + 2$ and $g(x) = \dfrac{x^2}{3x + 2}$.

    (a) Find a formula for $h(x) = g\big(f(x)\big)$. **2**

    (b) State any restrictions on the domain of h. **1**

7. On a suitable set of real numbers, functions f and g are defined by $f(x) = \dfrac{1}{x + 2}$ and $g(x) = \dfrac{1}{x} - 2$.

    Find $f\big(g(x)\big)$ in its simplest form. **3**

[END OF QUESTIONS]