Higher Exercise 7

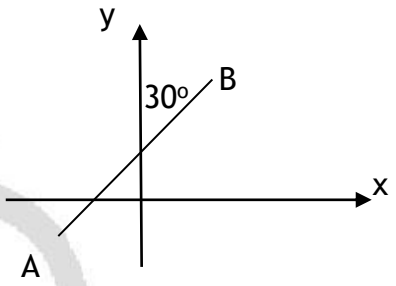
1. Find the equation of the straight line through the point (-4, 7) which is perpendicular to the line $5x + 3y - 1 = 0$.

2. For what values of x is the function $h(x) = 2x^3 + 3x^2 - 12x + 1$ decreasing?

3. The line AB is show opposite.

   The lines makes an angle of 30^o with the y-axis as can be seen in the diagram.

   Hence, calculate the gradient of this line.



4. Find the exact value of:

   a. $\tan 30^o$ b. $\sin 225^o$ c. $\cos \frac{5\pi}{6}$

5. Find the equation of the tangent to the curve $y = \frac{6x+4}{\sqrt{x}}$ at the point where $x = 4$.

6. A function is given by $f(x) = x^3 + ax^2 + bx + 2$.

   Given that $(x - 1)$ and $(x + 2)$ are factors of $x^3 + ax^2 + bx + 2$, find the values of a and b.

7. The tangent at the point T on the curve $4y = x^2 + 8x - 4$ is parallel to the line $8x - 2y = 5$.

   Find the coordinates of point T.