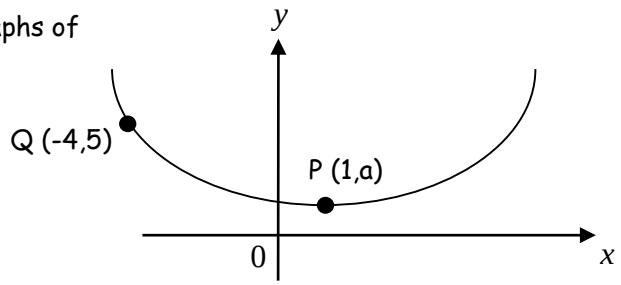
Higher Homework 07

1) The diagram shows the graph of the function $y = f(x)$.

Copy the diagram and on it sketch the graphs of

a) $y = f(x - 4)$.

b) $y = 2 + f(x - 4)$.



2) A function f is defined by $f(x) = 4\sqrt{x} + 1$.

a) Find the inverse function $f^{-1}(x)$.

b) Suggest a suitable domain and range for the function $f(x)$.

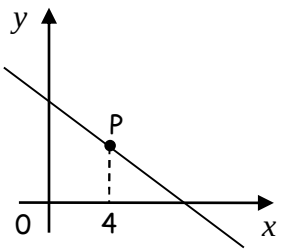
c) Suggest a suitable domain and range for the inverse function $f^{-1}(x)$.

3) A function f is given by $f(x) = \dfrac{3}{2x^4}$. Find an expression for $f'(x)$.

4) Given that $f(x) = \sqrt{x} + \dfrac{2}{x^2}$, find $f'(4)$.

5) The diagram shows the graph of $y = \dfrac{24}{\sqrt{x}}$, $x > 0$.

Find the equation of the tangent at P, where $x = 4$.



6) Express these in radians.

a) 160° b) 105° c) 4° d) 189°

7) Express each of the following in the form $a(x + b)^2 + c$

a) $3x^2 - 6x - 5$ b) $5x^2 + 30x - 2$

8) a) Calculate the limit as $n \longrightarrow \infty$ of the sequence defined by $u_{n+1} = 0{\cdot}9\, u_n + 10$, where $u_0 = 1$.

b) Determine the least value of n for which u_n is greater than half of this limit and the corresponding value of u_n.