



Higher Exercise 4

1. Find the derivative of the following:

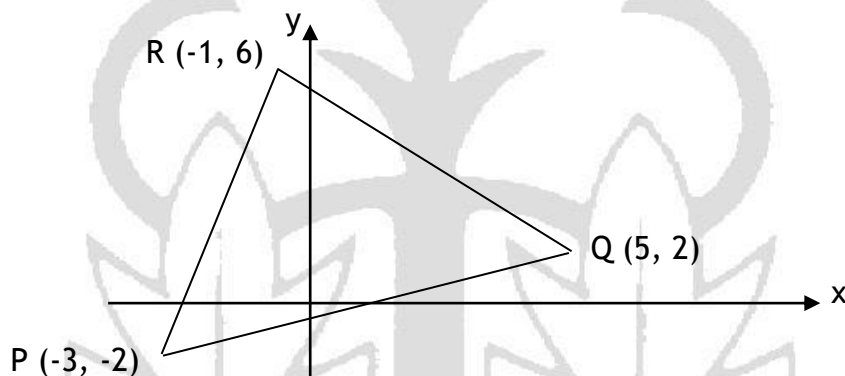
a. $y = (2x - 1)(3x + 5)$

b. $f(x) = x + \frac{1}{2x}$

2. The functions f and g are defined on suitable domains by $f(x) = 5x^2 + 1$ and $g(x) = 1 - x$.

- Find a simplified expression for $f(g(x))$.
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- Hence, solve $f(g(x)) - g(f(x)) = 9x^2 - 3$, where $x > 1$.

3. PQR is the triangle with coordinates $(-3, -2)$, $(5, 2)$ and $(-1, 6)$ respectively.



- Find the equation of the perpendicular bisector of PQ.
 - Find the equation of the median from Q.
 - The perpendicular bisector meets the median at point K; find the coordinates of point K.
4. A curve has the equation $y = 4x^2 - 5x + 1$.
- A tangent to this curve has a gradient of 3. Find the equation of this tangent.