

Practice 8, Questions

Exercises 6E page 93 and Miscellaneous exercises 6, questions 1 to 6, page 94, of Pure Mathematics 1 by Hugh Neil and Douglas Qualing.

Page 93:

1. Find the derivative of the function $f(x) = x^3$ at $x = p$.
2. Find the derivative of the function $f(x) = x^8$ at $x = p$.
3. Find the derivative of $f(x) = \frac{1}{x^2}$ at $x = p$.

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1. Find the equation of the tangent to $f(x) = 5x^2 - 7x + 4$ at the point $(2, 10)$.
2. Given the function $f(x) = x^3 + 5x^2 - x - 4$, find:
(a) $f'(-2)$, (b) the values of a such that $f'(a) = 56$.
3. Find the equation of the normal to $f(x) = x^4 - 4x^3$ at the point for which $x = \frac{1}{2}$.
4. Show that the equation of the tangent to $f(x) = \frac{1}{x}$ at the point for which $x = p$ is $p^2y + x = 2p$. At what point on the curve is the equation of the tangent $9y + x + 6 = 0$?
5. The tangent to the curve $f(x) = 6\sqrt{x}$ at the point $(4, 12)$ meets the axes at A and B. Show that the distance AB may be written in the form $k\sqrt{3}$, and state the value of k .
6. Find the coordinates of the two points on the curve $y = 2x^3 - 5x^2 + 9x - 1$ at which the gradient of the tangent is 13.