Rules for differentiation. Tangent and normal lines.

3.2.1

Find the derivative of the function (you don't need to simplify your answer):

(a) $y(x) = x^5 - 7x^2 + 10x + 9$,

(b) $f(t) = \sqrt[4]{t} + \sqrt[3]{t}$,

(c) $f(x) = \dfrac{5x^3 - 3\sqrt{x} + 1}{2x\sqrt{x}}$,

3.2.2

Find the points on the curve $y = x^3 - \dfrac{1}{x}$, where the tangent line is parallel to the line $4x - y = 1$.

3.2.3

The x-axis, the y-axis, and the normal line to the curve $y = x^2 + x$ at the point $(1, 2)$ form a triangle. Find the area of this triangle.