HW4

Please give complete, well written solutions to the following exercises.

Exercise 0.1. (2.1.30) Find $f'(a)$ for $f(x) = \frac{4}{\sqrt{1-x}}$.

Exercise 0.2. (2.2.46)

(a) If $g(x) = x^{2/3}$, show that $g'(0)$ does not exist.
(b) If $a \neq 0$, find $g'(a)$.
(c) Show that $y = x^{2/3}$ has a vertical tangent line at $(0, 0)$.
(d) Illustrate part (c) by graphing $y = x^{2/3}$.

Exercise 0.3. (2.3.50) If a ball is thrown vertically upward with a velocity of 80 ft/s, then its height after t seconds is $s(t) = 80t - 16t^2$.

(a) What is the maximum height reached by the ball?
(b) What is the velocity of the ball when it is 96 ft above the ground on its way up? On its way down?

Exercise 0.4. (2.3.66) Suppose the curve $y = x^4 + ax^3 + bx^2 + cx + d$ has a tangent line when $x = 0$ with equation $y = 2x + 1$ and a tangent line when $x = 1$ with equation $y = 2 - 3x$. Find the values of a, b, c, and d.