1. Find the derivatives of the following functions:

a) \( f(x) = 3x^5 + 2x^2 - x + 1 \)

b) \( g(x) = (2x - 1)^4(x - 4)^5 \)
2. Find the derivatives of the following functions:

a) \( f(x) = x^3 - x^{-3} \)

b) \( g(x) = \frac{\tan x}{\sin x + 1} \)
3. Find the equation of the tangent line to the curve $y = x^3 - 3x + \sqrt{x}$ at the point (1,-1).
4. Let \( y = x^3 - 48x + 1 \). Find the \( x \) coordinate of the points at which the graph has a horizontal tangent line.
5. A ball rolls down an inclined plane so that the distance travelled from time 0 to time $t$ seconds is given by $s(t) = 48 - 6t - 12t^2$. What is its velocity at time $t = 3$ seconds?