Some Differentiation Rules- HW Problems

Find the derivative of the following functions (where they are defined).

1. $f(x) = x^{10}$
2. $g(x) = x^3 - 3x + 10$
3. $f(t) = t^{11} + 2t^9 - 6t^3 + 3$
4. $g(x) = 3^{20}$
5. $f(t) = -\frac{4t^5}{5}$
6. $g(x) = (2x^2 + 1)(3x^3 + x)$
7. $f(x) = x(x^2 + 3) + (x^2 + 2)(x - 2)$
8. $f(t) = \frac{3t^6 - 4t^8}{2t^3}$
9. $g(x) = \frac{(x^2-1)(x^3+3x)}{x^2-x}$

10. Let $f(x) = x^3 + 3x^2 - 9x + 2$. At what value of x does the slope of the tangent line to the graph of $y = f(x)$ equal 0?

11. Find the second derivative of the following functions.

$a.$ $f(x) = x^8 - 2x^5 + \frac{5x^2}{2} - 2x + 1$

$b.$ $y = 2t^4 - 3t^2 - t + 6$

12. Let $f(x) = x^4 - 6x^2$. For what values of x is $f''(x) = 0$?