1. The chain rule is used when there are 2 functions. An outside function (the one you see right away – the "***entire***" thing) and then the function "***inside***" it. For each of the following, find u, where this is the "outside" function and v where this is the "inside" function. Then differentiate each and multiply the result together to complete the derivative. The first one has been done for you.

    a) $g(x) = (2x + 3)^3$ b) $h(x) = (4x + 5)^5$

        So:

        $u = (2x + 3)^3$ and $v = 2x + 3$

        Derivative of both:

        $u' = 3(2x + 3)^2$ and $v' = 2$

        Multiply u' by v'

        $g'(x) = 2(3)\,(2x + 3)^2$

        Simplify to finish:

        $g'(x) = 6\,(2x + 3)^2$

    c) $y = 3(2x^2 - 4)^3$ d) $y = -(-x^2 - 5)^2$

    e) $y = \sqrt{x^3 + 3x}$ f) $y = \sqrt{x^4 + 6}$

2. For the functions below, determine the equation of the tangent ($y = mx + c$) for the specified x-coordinate.

a) $y = (x^2 - 3)^4$ where $x = 2$

b) $f(x) = 2\sqrt{8x - 4}$ where $x = 1$