

213 Problem Set 6 Solutions

Two straightforward product rule questions. As a reminder: $(fg)' = f'g + fg'$.

§3.4 7 The first question asks for the derivative of $(x + 2)(2x^2 - 3)$. Using the above rule we have $(1 + 0)(2x^2 - 3) + (x + 2)(2(2x^1) - 0)$. I tried to include more details to be clear on where it came from. It's probably more typical to write it as $(2x^2 - 3) + (x + 2)(4x)$.

§3.4 21 This one is basically the same, again product rule. $h(x) = xf(x) + 4g(x)$. We *do* need a product rule for the $xf(x)$ part since they are multiplied together, we don't for the second part since 4 is a constant. So, here's the first level step: $h'(x) = 1f(x) + xf'(x) + 4g'(x)$. And now we want to find the value at $x = 1$, so we put 1 for all x s: $h'(1) = 1f(1) + 1f'(1) + 4g'(1)$ and now we look up values from the table to get $h'(1) = 1(3) + 1(-1) + 4(4) = 3 - 1 + 16 = 18$.