MAT 136 (Calculus I), Prof. Jim Swift

In-class worksheet on the Indefinite Integral

Find the following general antiderivatives (also called indefinite integrals). Note that there is no product rule, and no quotient rule, for antiderivatives. Don't forget the $+C$ to turn *an* antiderivative into the *general* antiderivative.

1. $\displaystyle\int x^2 - 3x + 2 \, dx = \dfrac{x^3}{3} - \dfrac{3x^2}{2} + 2x + C$

2. $\displaystyle\int x(1 + x^2 + x^3) \, dx = \int x + x^3 + x^4 \, dx = \boxed{\dfrac{x^2}{2} + \dfrac{x^4}{4} + \dfrac{x^5}{5} + C}$

3. $\displaystyle\int 7x^{-5} \, dx = \dfrac{7x^{-4}}{-4} + C$ Note: $-5 + 1 = -4$. (Not -6)

4. $\displaystyle\int \dfrac{\sqrt{x} + x^2}{x} \, dx = \int x^{-1}(x^{\frac{1}{2}} + x^2) \, dx = \int x^{-\frac{1}{2}} + x \, dx$

   $= \dfrac{x^{\frac{1}{2}}}{\frac{1}{2}} + \dfrac{x^2}{2} + C = \boxed{2x^{\frac{1}{2}} + \dfrac{x^2}{2} + C}$