Antiderivatives

p. 327 - 331 (4.9) # 59

1. A function $F(x)$ is an **antiderivative** of a function $f(x)$ if $F'(x) = f(x)$ for all x in the domain of f. The process of finding an antiderivative is **antidifferentiation**.

2. The family of all antiderivatives of a function $f(x)$ is the **indefinite integral** of f with respect to x and it denoted by $\int (f(x))\, dx$.

3. If F is any function such that $F'(x) = f(x)$, then $\int (f(x))\, dx = F(x) + C$ is called the general solution and C is called the **constant of integration** (an arbitrary constant).

---

1. State three functions F_1, F_2, F_3 whose derivatives are $f(x) = 3x^2$. Now sketch all three of your functions on the same coordinate plane. Compare these with $f(x) = 3x^2$.

2. Find a general solution of the differential equation $\frac{dy}{dx} = 3x^{-4}$ and check by differentiation.