Problem 1

Find ALL possible functions whose derivative is $\sqrt{x} + 3x^8 + \frac{1}{\sqrt{x}}$.

Problem 2

Find ALL possible functions whose derivative is $\dfrac{x+1}{x^3}$.

Problem 3

Let $p(t)$, $v(t)$ and $a(t)$ denote the position, velocity and acceleration functions of a particle. If $a(t) = 6t + 1$, $v(1) = 2$ and $p(0) = 1$, determine $v(t)$ and $p(t)$.

Problem 4

Solve the following initial value problem (i.e. find the function, y, with the following properties):
$\frac{dy}{dx} = x^2 + \cos(x), \quad y(\frac{\pi}{2}) = 0.$

Problem 5

Read section 4.3 in the book.