```latex
\documentclass[10pt]{article}
\usepackage{setspace}
\usepackage{amsmath,amsfonts,amsthm,amssymb}
\usepackage{color}
\usepackage{fancyhdr}
\usepackage{chngpage}
\usepackage{enumerate}
\usepackage{graphicx}
\usepackage{boxedminipage}

\title{Homework 9  in \LaTeX}
\author{Robert Brothers Mechanical Engineering Student @ UTSA}
\begin{document}
\doublespacing
\footnotesize
\maketitle
\date

\section{Question 1: The Lagrangian and Equations of Motion}
\subsection{(a) Write an Expression for the Lagrangian of the Particle}
\begin{equation}
\begin{align}
L  &= - 1.0 R g m_{1} \sin{\left (q_{1} \right )}\nonumber\\
&\qquad + 0.5 \dot{q}_{1}^{2} \left(I_{1} + R^{2} m_{1}\right)
\end{align}
\end{equation}

\subsection{(b) Find the Equation of Motion of the Particle}
\begin{equation}
\begin{align}
\tau_{k} &= 1.0 I_{1} \ddot{q}_{1}\nonumber\\
&\qquad + 1.0 R^{2} m_{1} \ddot{q}_{1}\nonumber\\
&\qquad + 1.0 R g m_{1} \cos{\left (q_{1} \right )}
\end{align}
\end{equation}

\section{Question 2: Equations of Motion of a Two Link Manipulator}
\subsection{(a) Find the Lagrangian}
\begin{equation}
\begin{align}
L  &= 0.5 I_{1} \dot{q}_{1}^{2} + 2.0 g m_{2} q_{2} \cos{\left (q_{1} \right )}\nonu
mber\\
&\qquad + 0.5 m_{2} \dot{q}_{1}^{2} + 6.12323399573677 \cdot 10^{-17} m_{2} \dot{q}_
{1} \dot{q}_{2}\nonumber\\
&\qquad + 0.5 m_{2} \dot{q}_{2}^{2}
\end{align}
\end{equation}

\subsection{(b) Find Equation of Motion}
\begin{equation}
\begin{align}
\tau_{k} &= 2.0 g m_{2} q_{2} \sin{\left (q_{1} \right )} - 2.0 g m_{2} \cos{\left (
q_{1} \right )}\nonumber\\
&\qquad + 1.0 m_{2} \ddot{q}_{2} + 1.0 \ddot{q}_{1} \left(I_{1} + m_{2}\right)
\end{align}
\end{equation}

\section{Question 3: Equations of Motion of a Pendulum}
\subsection{(a) Find the Lagrangian of the Pendulum}
\begin{equation}
\begin{align}
L  &= l_{1} m_{2} \left(- 1.0 g \sin{\left (q_{1} \right )} + 0.5 l_{1} \dot{q}_{1}^
{2}\right)
\end{align}
\end{equation}

\subsection{(b) Find Equation of Motion}
\begin{equation}
\begin{align}
\tau_{k} &= 1.0 l_{1} m_{2} \left(g \cos{\left (q_{1} \right )} + l_{1} \ddot{q}_{1}
\right)
\end{align}
\end{equation}
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\end{document}

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