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\documentclass[12pt,twoside]{amsart}
\usepackage{amssymb, amsmath, mathrsfs, enumerate, tikz, array, setspace, pgfplots, multicol}
\setlength{\voffset}{-1in}
\setlength{\textheight}{9.5in}
\setlength{\textwidth}{6.5in}
\setlength{\hoffset}{0in}
\setlength{\oddsidemargin}{0in}
\setlength{\evensidemargin}{0in}
\setlength{\marginparsep}{0in}
\setlength{\marginparwidth}{0in}
\setlength{\headsep}{0.25in}
\setlength{\headheight}{0.5in}

```

% THEOREM ENVIRONMENTS

```

\theoremstyle{plain}
\newtheorem{thm}{Theorem}[section]
\newtheorem{lemma}[thm]{Lemma}
\newtheorem{example}[thm]{Example}
\newtheorem{proposition}[thm]{Proposition}
\newtheorem{principle}[thm]{Principle}
\newtheorem{cor}[thm]{Corollary}
\newtheorem{question}[thm]{Question}
\newtheorem{conj}[thm]{Conjecture}
\newtheorem{defn}[thm]{Definition}
\theoremstyle{definition}
\newtheorem{recipe}[thm]{Recipe}
\newtheorem{propdef}[thm]{Proposition/Definition}
\newtheorem{definition}[thm]{Definition}
\newtheorem{remarks}[thm]{Remarks}
\newtheorem{ex}[thm]{Example}
%\theoremstyle{remark}
\newtheorem{remark}[thm]{Remark}
\newtheorem*{note}{Note}
\newcommand{\numberwithin{equation}{section}}

```

% COMMANDS

```

\newcommand{\solution}{{\color{blue} \textsc{\ \ Solution.\ \ }}}
\newcommand{\revisedsolution}{{\color{blue} \textsc{\ \ Revised Solution.\ \ }}}
\newcommand{\Z}{\mathbb{Z}} % the integers
\newcommand{\N}{\mathbb{N}} % natural numbers

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\newcommand{\R}{\mathbb{R}} % real nubers
\newcommand{\Q}{\mathbb{Q}} % rational numbers
\newcommand{\divides}{\ \vert \ }
\newcommand{\st}{\ : \ } % such that
\newcommand{\inv}{^{-1}} % inverse
\newcommand{\img}{\mathrm{im}} % image
\newcommand{\into}{\hookrightarrow} % injection
\newcommand{\onto}{\twoheadrightarrow} % surjection
\newcommand{\map}[1]{\xrightarrow{\#1}} % named map
\newcommand{\id}{\mathrm{id}} % identity map

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\title{Math 108 Proof Portfolio}
\author{\textbf{Your name}}

```

```

\begin{document}

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```

\maketitle

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\section{A direct proof}
\begin{defn} Write down any definitions you will use here.
\end{defn}

```

You can also include in here any propositions or theorems from the book you want to reference to make it easier for the reader.

```

\begin{proposition}[Homework X, Problem Y]
Write down the statement you want to prove here.
\end{proposition}
\begin{proof}
Write down your proof here
\end{proof}
\section{Proof using a contrapositive}
\begin{proposition}[Homework X, Problem Y]
Write down the statement you want to prove here.
\end{proposition}
\begin{proof}
Write down your proof here
\end{proof}
\section{Proof by contradiction}
\begin{proposition}[Homework X, Problem Y]

```

Write down the statement you want to prove here.

`\end{proposition}`

`\begin{proof}`

Write down your proof here.

`\end{proof}`

`\section{If and only if (equivalence) proof}`

`\begin{proposition}[Homework X, Problem Y]`

Write down the statement you want to prove here.

`\end{proposition}`

`\begin{proof}`

Write down your proof here

`\end{proof}`

`\section{An induction (or strong induction) proof}`

`\begin{proposition}[Homework X, Problem Y]`

Write down the statement you want to prove here.

`\end{proposition}`

`\begin{proof}`

Write down your proof here

`\end{proof}`