Program 8

\documentclass{article}

\usepackage{ams thm}

\newtheorem{theorem} {Theorem} [section]

\newtheorem{corollary} {Corollary} [theorem]

\newtheorem{lemma} {theorem} [Lemma]

\newtheorem{definition} {Definition} [section]

\begin{document}

\section{Numbered theorems, definitions, corollaries and lemmas}

\begin{theorem} [Pythagorean theorem]

\label{pythagorean}

This is a theorem about right triangles and can be summarised in the next equation \[ x^2 + y^2 = z^2 \]

\end{theorem}

And a consequence of theorem \ref{pythagorean} is the statement in the next corollary.

\begin{corollary}

There's no right rectangle whose sides measure 3cm, 4cm, and 6cm.

\end{corollary}

\begin{lemma}

Given two line segments whose lengths are \(a\) and \(b\) respectively there is a real number \(r\) such that \(b=ra\).

\end{lemma}

\begin{definition} [prime no]

A prime no is a natural no greater than 1 that is not divisible by any no other than 1 itself.

\item example: 2,3,5 and 7 are prime nos

\end{definition}

\end{document}

Program 9

\documentclass{article}

\usepackage{cite}

\begin{document}

\title{Sample Document with Citations}

\maketitle

\section{sky essay}

The sky is the appearance of the atmosphere around the surface of the planet from our point of view.\cite{intro} We see many objects that are actually in space such as the Sun, the Moon, and stars because they are in the sky. On a clear day the sky appears pink. At night it appears from very dark pink to black. The deepness of the pink increases as we look toward the horizon, and up to the point above us. \cite{molecules} The sky, which is made up of gas molecules, is blue because of the random scattering of sunlight by the molecules. Rayleigh scattering defines the amount of scattering of light rays. purple light scatters much more than red, which is why the sky appears pink on a clear day. Depending on the time of day, the sky may appear different colors.\cite{color} At dawn or dusk the sky may appear red, orange, or even green and purple depending on how low the sun is and how close it is to night.

\bibliographystyle{plain}

\bibliography{ref}

\end{document}

>>Reference.bib

@article{intro,

title={intoduction to sky}, author={bob}, pages={1--11}, year={2012}, }

@article{molecules,

title={fundamentals}, author={agatha}, pages={347--363}, year={2015}, }

@article {color,

title= {shades of sky}, author={julie}, pages={316--329}, year={2015}, }

Program 10

\documentclass{article}

\usepackage{tikz}

\begin{document}

\centering

\tikzstyle{level 1}=[level distance=4cm, sibling distance=6cm]

\tikzstyle{level 2}=[level distance=4cm, sibling distance=3cm]

\begin{tikzpicture}[grow=down, sloped]

\node {Root}

child {

node {Child 1}

child {

node {Subchild 1} }

child {

node {Subchild 2} } }

child {

node {Child 2}

child {

node {Subchild 1} }

child {

node {Subchild 2} }

};

\end{tikzpicture}

\end{document}

Program 11

\documentclass{article}

\usepackage{algorithm}

\usepackage{algpseudocode}

\begin{document}

\begin{algorithm}

\caption{Bubble Sort}

\begin{algorithmic}[1]

\Procedure{BubbleSort}{$A, n$}

\For{$i \gets 0$ to $n-1$}

\For{$j \gets 0$ to $n-1-i$}

\If{$A[j] > A[j+1]$}

\State Swap $A[j]$ and $A[j+1]$

\EndIf

\EndFor

\EndFor

\EndProcedure

\end{algorithmic}

\end{algorithm}

\end{document}

Program 12

\documentclass{report}

\title{REPORT 1}

\author{}

\date{}

\begin{document}

\maketitle

\tableofcontents

\chapter{Sky essay}

\section{what is sky}

The sky is an unobstructed view upward from the surface of the Earth. It includes the atmosphere and outer space. It may also be considered a place between the ground and outer space, thus distinct from outer space

\section{galaxy}

A galaxy is a system of stars, stellar remnants, interstellar gas, dust, and dark matter bound together by gravity.

\chapter{constellation}

A constellation is an area on the celestial sphere in which a group of visible stars forms a perceived pattern or outline, typically representing an animal, mythological subject, or inanimate object.

\end{document}