

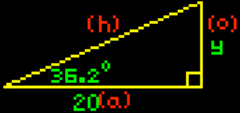
# ADVANCED MATHS WORKSHOP

Module 12.3 - Tan ratio in a right angled triangle

Screen 5

An example

To find the opposite side given the adjacent side and the angle



Step 1 Name the sides

Step 2 Write down the ratio

$$\frac{o}{a} = \tan 36.2^\circ$$

Calculator, Documents, Thinking, Ambulance, Door, Alarm icons

## TEACHERS' NOTES



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# INTRODUCTION

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## Global Advanced Maths Documentation

This Global Advanced Maths User Guide is intended for Parents, Tutors and Students of all experience levels. It describes how to use the Global Advanced Maths features and an introduction of the many benefit.

## Overview

The **Global Advanced Maths Workshop** is a collection of modules and worksheets, which provide personal support for the 'A' Level Maths student. It contains primary teaching material, suitable for private study, either at home, school or any other Learning Centre.

The material has been written to cover the subject of 'A' Level Mathematics and the syllabus requirements for a wide range of Examining Boards. However, it is envisaged that it will also be suitable for undergraduates studying subjects such as Engineering, Business Studies and Social Sciences.

Advanced Maths Workshop is divided into fourteen volumes, containing a hundred units, each being accompanied by its worksheets, which provide ample scope for the practice necessary for success.

Each unit is designed to be completed in approximately 60 minutes, although this will be dependent on the age and skill of the student. Most units are divided into sections, with a menu, which allows the student to start at the section of their choice. There is also an option to quit and resume, at a point within a section.

It is assumed that the student will use a scientific calculator where necessary, and most answers are required to be expressed to two decimal places or three significant figures. This software version contains its own pop-up scientific calculator.

Student assessment is based on the answers given by the student typed into the unit test, which follows each learning unit. The questions in the test are drawn at random from a question bank, thereby helping to preserve the integrity of the test. With a printer attached to the computer, a Certificate of Achievement can be printed, containing the student's name, group, score and date of test. If no printer is attached, the same information is displayed on screen.

# ADVANCED MATHS WORKSHOP- VOLUMES

## VOLUMES 1-7 PURE MATHS

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### 1. Series and Elementary Algebra (1)

- 1.1 Series
- 1.2 Infinite Series
- 1.3 Binomial Theorem
- 1.4 Remainder and Factor Theorems
- 1.5 Surds and Mathematical Induction
- 1.6 Partial Fractions
- 1.7 Uses of Partial Fractions

### 2. Algebra plus Complex Numbers.

- 2.1 Quadratic Equations (1)
- 2.2 Quadratic Equations (2)
- 2.3 Inequalities and Curve Sketching
- 2.4 Permutations and Combinations
- 2.5 Complex Numbers
- 2.6 De Moivre's Theorem

### 3. Trigonometry

- 3.1 Circular Measure
- 3.2 The six Trigonometrical Ratios
- 3.3 Sine and Cosine Rules
- 3.4 Solutions of Triangles in Two and Three dimensions
- 3.5 The addition Formulae
- 3.6 The Factor and Other Formulae
- 3.7 Solving Trigonometrical Equations

### 4. Differentiation

- 4.1 Limits and Differentiation from First Principles
- 4.2 Methods of Differentiation (1)
- 4.3 Methods of Differentiation (2)
- 4.4 Higher Derivatives
- 4.5 Uses of Differentiation
- 4.6 Simple Differential Equations

### 5. Plane Coordinate Geometry

- 5.1 The Straight Line (1)
- 5.2 The Straight Line (2)
- 5.3 The Circle
- 5.4 The Parabola
- 5.5 The Ellipse
- 5.6 The Hyperbola

### 6. Integration

- 6.1 Introduction to Integration
- 6.2 Important uses of Integration
- 6.3 Methods of Integration (1)
- 6.4 Methods of Integration (2)
- 6.5 Methods of Integration (3)
- 6.6 Methods of Integration (4)
- 6.7 General Revision of Integration.

## **7. Functions and Graphs**

- 7.1 Functions
- 7.2 Graphs of Functions
- 7.3 Exponential and Logarithmic  
Functions
- 7.4 Cartesian Graphs
- 7.5 Reduction to Linear form
- 7.6 Polar Co-ordinates

## VOLUMES 8-11 APPLIED MATHS

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### 8. Dynamics

- 8.1 Velocity and Acceleration
- 8.2 Projectiles (1)
- 8.3 Projectiles (2)
- 8.4 Simple Harmonic Motion
- 8.5 Motion in a Circle
- 8.6 Vectors in Dynamics (1)
- 8.7 Vectors in Dynamics (2)

### 9. Dynamics (2)

- 9.1 Newton's Laws of Motion (1)
- 9.2 Newton's Laws of Motion (2)
- 9.3 Work and Power
- 9.4 Energy
- 9.5 Impulse
- 9.6 Indirect Impact

### 10. Statics

- 10.1 Coplanar Forces (1)
- 10.2 Coplanar Forces (2)
- 10.3 Coplanar Forces (3)
- 10.4 Coplanar Forces (4)
- 10.5 Friction
- 10.6 Frameworks
- 10.7 Centre of Mass
- 10.8 Work

### 11. Numerical Methods, Matrices, Vectors

- 11.1 Numerical Integration
- 11.2 Numerical Solutions of Equations
- 11.3 Matrices
- 11.4 Geometrical Transformations
- 11.5 Matrix Equations
- 11.6 Introduction to Vector Algebra
- 11.7 Vector Algebra (2)
- 11.8 Vector Algebra (3)

**12. Measures of Positions and Dispersion plus Regression**

- 12.1 Revision of Basic Ideas
- 12.2 Measures of Central Tendency
- 12.3 Measures of Dispersion
- 12.4 Times Series and Trend Lines
- 12.5 Weighted Averages
- 12.6 Regression and the Method of Least Squares
- 12.7 Product Moment Correlation Coefficient
- 12.8 Rank Correlation
- 12.9 Cumulative Frequency Distributions

**13. Probability plus Probability Functions**

- 13.1 Probability (1)
- 13.2 Probability (2)
- 13.3 Probability (3)
- 13.4 Probability Functions (1)
- 13.5 Probability Functions (2)
- 13.6 Discrete Variables
- 13.7 Continuous Variables (1)
- 13.8 Continuous Variables (2)
- 13.9 Continuous Variables (3)

**14. Sampling plus Goodness of Fit and Contingency Tables plus Testing Null Hypothesis**

- 14.1 Random Samples
- 14.2 Estimation (1)
- 14.3 Estimation (2)
- 14.4 Small Samples
- 14.5 Introduction to the Null Hypothesis
- 14.6 Applications of Null Hypothesis
- 14.7 The Chi-Squared Distribution
- 14.8 Contingency Tables

## INSTALLATION

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This product is available for installation provided by SiR Learning Systems Ltd on a variety of media.

It is part of a series of products covering Numeracy, Literacy, Languages and Science.

Tracking and Automatic Marking is provided by the *Discovery* Management System and is either preinstalled locally or a link is available on the Internet to a hosted version of Discovery.

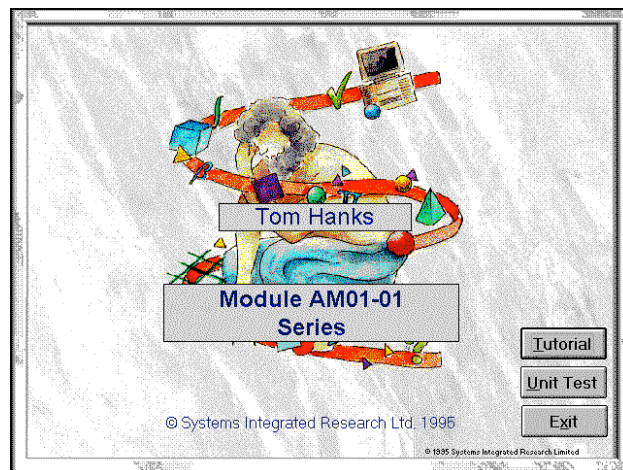
Instructions will be provided, or our installation Engineer will provide on-site installation.

## USING THE ADVANCED MATHS WORKSHOP

The Advanced Maths Workshop, when successfully installed, will have registered three sets of courseware within *Discovery* - these will be Advanced Maths Workshop - Pure, Advanced Maths Workshop - Applied and Advanced Maths Workshop - Statistics.

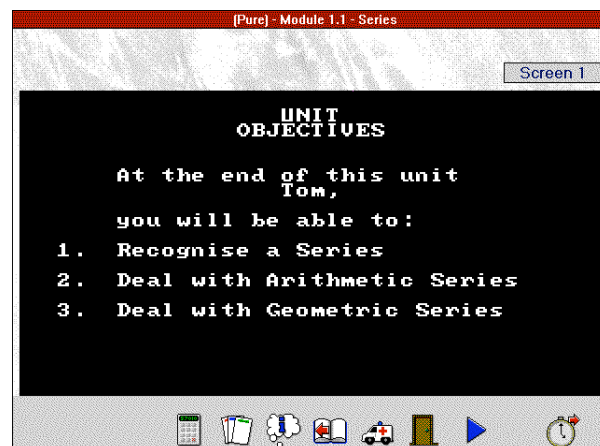
To run a unit from the *Discovery* Student Front End software it is a simple matter of selecting it from one of the sets and either double clicking on it or by selecting the unit and clicking on it with the Right button on the Mouse. A menu will then appear with an option to run the unit. Select **Run** and the unit will then start.

The Unit Introduction Screen is displayed showing student name, unit selected and options for selecting Tutorial and Unit Test.



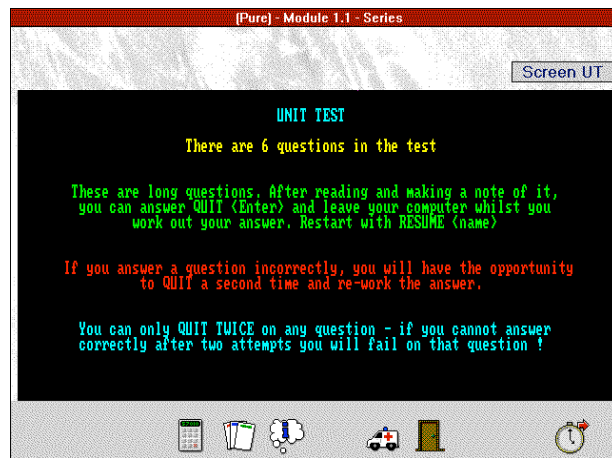
### Tutorial

Click on **Tutorial** to begin the unit. The following screen shows an example: -



## Unit Test

Click on **Unit Test** to run the unit test. The following screen shows an example: -



In order to show a score for the unit within *Discovery*, the student must complete the unit test in full.

## The Icons

The icons along the bottom of the screen allow the student to move through a unit test or tutorial and load other options. To select, move the mouse over the desired icon and click. The icons are: -



Go to previous page.



Load calculator.



Load Worksheets.



Get information on student.



Load menu.



Get help on unit.



Exit to Menu.



Go to next page.

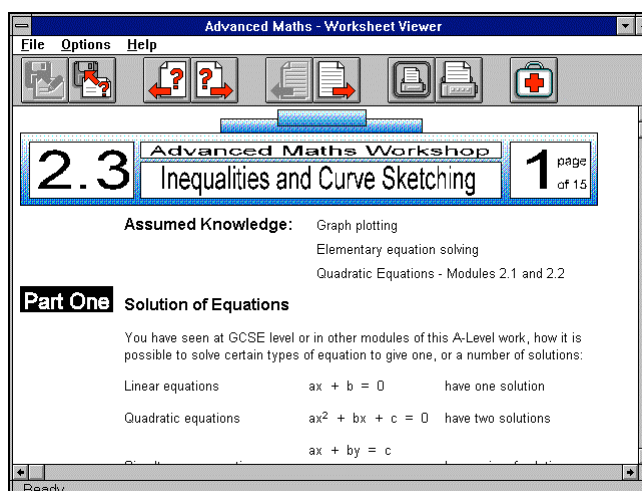


Move on to next page

Note: the calculator does not follow the normal rules of precedence and so parentheses must be used in order to ensure correct calculation of your entries.

## WORKSHEETS

The following screen will be displayed when worksheets are selected from an Advanced Maths Workshop unit,

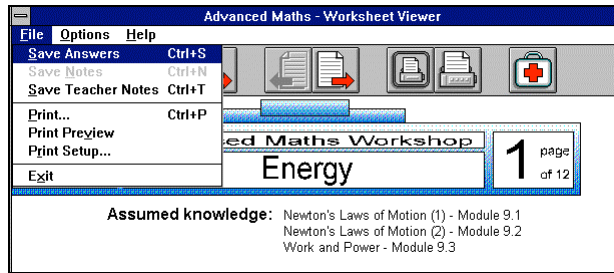


The Worksheet Viewer allows the student to read, and work on, Global Advanced Maths units worksheets. Worksheets can be printed and answers can be entered directly onto a worksheet. Answers that are entered directly onto the worksheet are stored and used in the section tests of the appropriate unit.

### The Worksheet Viewer Options

The icons and drop down menus along the top of the screen allow the user to work through the worksheet. To select an option from a drop down menu, click on the option and then move the highlight bar to select. Notice that there are also other key presses, which can be used to perform the same operations. **Ctrl + S** means hold down the **Ctrl** key and press **S**, **F9** means press the **F9 Function** key and **Shift F5** means hold down the **Shift** key and press the **F5** function key. The icons along the top of the screen can also be used instead.

## File and Icons



Save Notes.



Save Worksheet Answers.

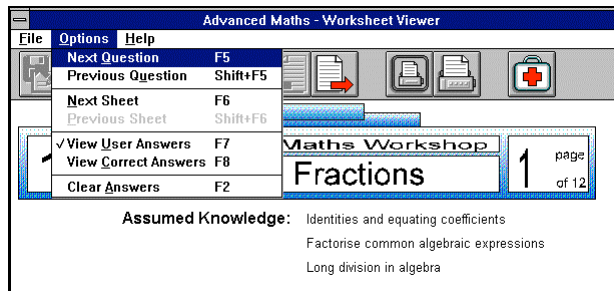


Print preview.  
Displays worksheet  
and any notes to  
screen.



Print out worksheet to printer.

## Options and Icons



Go to previous  
question.



Go to next question.

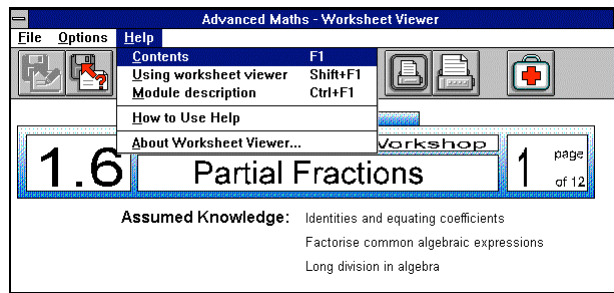


Go back to previous  
page.



Go to next page.

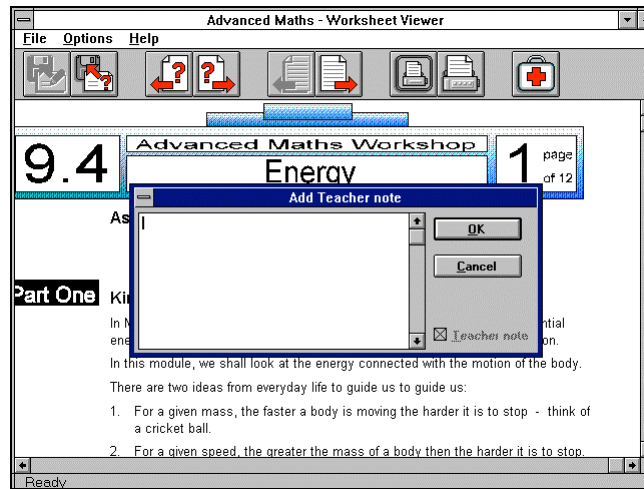
## Help and Icons



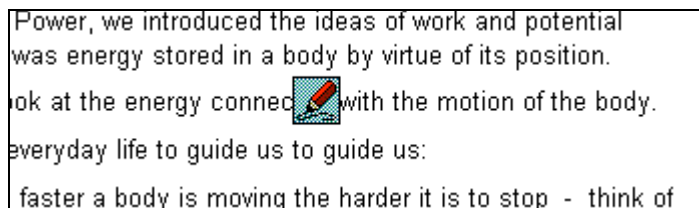
Displays help.

## Adding Notes to a Worksheet

To enter a note on a worksheet, double click on the worksheet (avoiding the answer box area). Up to 100 notes per module can be added to a worksheet. A window will be displayed to enter the note, as shown in the following example screen: -



Once the note has been entered a small 'pencil' icon will appear on the worksheet indicating that a note has been added at that point.



## Deleting Notes from a Worksheet

To delete a note, double click on the '**pencil**' and select '**delete note**' from the menu.

## Saving Notes on a Worksheet

To save notes for use at a later date they must be saved with the **File...Save** option.

If notes are added to a worksheet and they are not saved a prompt will be displayed when the worksheet viewer is exited asking if notes should be saved before exiting.

## Entering Answers on a Worksheet

Answers can be entered into pre-defined answer boxes on the worksheets. To enter answers use the Next and Previous Question buttons to move to the next or previous answer, alternatively click on an answer entry box to 'activate' it. When a box is active a flashing cursor is seen inside it, an answer can now be entered inside the chosen box.

## Saving Answers on a Worksheet

To save notes for use at a later date they must be saved with the **File...Save Answers** option. Any answers will automatically be loaded and used the next time worksheets are viewed for the unit.

Answers entered onto the worksheets and entered automatically into the end of section tests within the units but can be changed by the student if required.

## TECHNICAL SUPPORT

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In the event of experiencing problems, either during the installation or running of the software, the SiR Support Department will be happy to handle any queries.

Before contacting SiR Support Department, it would be helpful to have listings or the following files available:

Screenshot of any messages displayed.

Telephone Technical Support on 01773 7820011 or email your queries on [technicalsupport@sirplc.co.uk](mailto:technicalsupport@sirplc.co.uk)