



# *Maths Connexions for Adults (MCA Online)*

**An Interactive Module based on  
MCA Online Website**

<http://www.staff.vu.edu.au/mcaonline>

Adult Basic Education  
Victoria University- TAFE Division  
Melbourne

# Maths Connexions for Adults

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MCA Online Module

A module based on Math Connexions for  
Adults (MCA Online) Website

Developed by  
Syed Javed

This module is developed with funding support from the Centre for Education Development and Support, Victoria University.

Produced by the Program of Adult Basic Education within the Department of Adult Literacy and Work Education, Victoria University of Technology TAFE Division.

Content, design and layout by Syed Javed

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# STUDY GUIDE

## Purpose

Welcome to MCA Online Module. This module is designed to help you acquire the skills and knowledge of learning maths using MCA online website. The module aims to familiarise you with a range of online resources helpful in practicing and solving maths problems.

This module aims to develop learning to learn and problem solving skills in maths by making use of online maths resources. The activities in the module have been designed to reinforce and complement classroom based learning. If learners would like some support for the completion of the activities, they are encouraged to contact their tutor via phone, email or message board facilities.

## Duration

This module nominally requires 18 hours for completion of learning outcomes. The actual time may be more or less as the duration will depend on individual experiences, prior knowledge and access to online facilities. You will be expected to attend 4 hours of training and induction sessions in a computer lab. You can complete learning activities and assessment tasks in a flexible time frame in negotiation with your tutors.

## Prerequisite

You are expected to have some prior knowledge of using computers and the Internet. You are also expected to be an enrolled student within the TAFE Division of Victoria University.

During the module you will be using MCA Online website which requires Netscape Navigator 3.0 or Internet Explorer 3.0 or later version of Internet browsers. Most Victoria University computers now have Netscape Navigator installed on them.

## How to use this module

This module is divided into four sections. Each section covers one learning outcome. Each learning outcome has a number of learning activities. Completing these learning activities will help you achieve the learning outcome for that section.

At the end of each section there is an assessment task. You will need to complete these assessment tasks to demonstrate your competence for each learning outcome.

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## Learning Outcomes

The module aims to achieve four learning outcomes listed below. In order to achieve these learning outcomes you will be introduced to a number of learning activities within each section. The learning activities are:

### **Learning Outcome 1:**

#### ***Communicate using MCA Online Message Board***

In this section learning activities will include:

1. Register with MCA online message board
2. Post a new message
3. Locate, read and reply to a posted message
4. Participate in real time tutorial

### **Learning Outcome 2:**

#### ***Identify appropriate paths for solving problems at MCA Online***

In this section learning activities will include:

1. Follow a learning unit to understand basic maths concepts
2. Solve new problems using webmath links
3. Locate Dr Math responses to solve maths problems

### **Learning Outcome 3:**

#### ***Find and use relevant maths tools and resources***

In this section learning activities will include:

1. Find maths terms in online glossaries
2. Convert units using online calculators
3. Operate an online scientific calculator

### **Learning Outcome 4:**

#### ***Become familiar with online maths symbols and expressions***

In this section learning activities will include:

1. Locate and use maths symbols and formulae
2. Solve problems using online links
3. Solve interactive puzzles

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## Assessment Guidelines

Assessment for the module is based on negotiated outcomes between the tutor and student. You are expected to demonstrate satisfactory achievement of learning outcomes covered by this module.

You will be presented with assessment tasks at the end of each section. Complete these tasks and return them to your tutor.

Alternative tasks can be negotiated with your tutor to demonstrate satisfactory achievement of competence.

## Contacting Your Tutor

Your MCA Online module tutor is available via phone and email to answer your questions and concerns even after in-class sessions. You can send up to 3 email queries per week to your tutor. In most cases your tutor will answer your email within 24 hours.

When sending an email message to your tutor please type "mca online" in the subject heading of your email.

You can also contact your tutor and other MCA Online users by posting a message on MCA Message Board. When you post a message on Message Board it can be read by all users and any of the registered users can reply to your message.

Phone: 03-9284 8873

Email: syedjaved@vu.edu.au

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# SECTION 1: Communicating Online

When you have completed this section, you should be able to perform and demonstrate the following learning outcome in accordance with the assessment criteria and conditions listed below.

## **Learning Outcome:**

Communicate using MCA Online Message Board and Live Chat facility.

## **Assessment Criteria:**

- Register with MCA Online Message Board to obtain unique login details.
- Post a new message in a selected conference folder on the Message Board
- Locate, read and reply to a posted message
- Join Live Chat facility on MCA Online and participate in real time tutorial

## **Conditions:**

Access to an environment conducive to computer assisted learning.

During learning and assessment activities students will have access to MCA Online Website.

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# SECTION 1: Communicating Online

Using MCA online you can get in touch with other students and teachers in two ways:

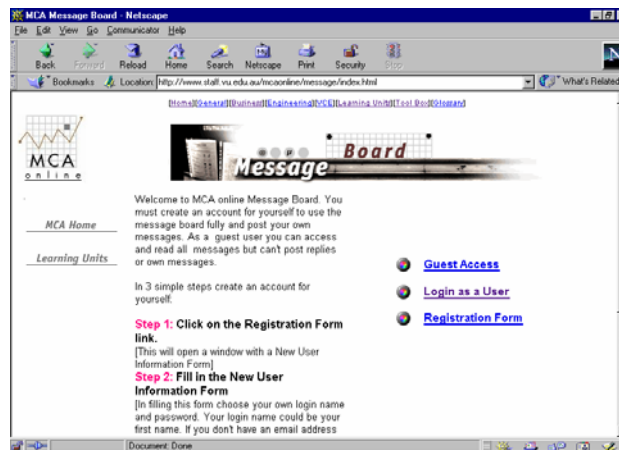
1. By using MCA Message Board you can post your own messages for others and read other peoples messages and responses
2. By using MCA Online Chat you can join live chat sessions and talk to fellow students and teachers using Online chat.

## Using MCA Message Board

### Logging in as a Guest

You can use the Message Board easily once you arrive at MCA Online website. There are two ways to enter MCA Message Board. If you just want to browse the conferences without posting your own messages or participating in chat, you should log in as a guest. To do so, click Guest on the login page.

The main message board page appears with the Conferences list and a welcome message. Click on the + sign next to a conference to expand it and then click on a message heading to open it for reading.



### Tip

Sometimes after logging you as a guest, MCA Message Board may not allow you to log in as a registered user. In this situation it will not show you the login window. What you need to do is exit your browser and restart your Netscape program. Come to MCA Message Board page and click on login as a user link.

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## Logging in as a New User

If you want to participate in Message Board either by posting messages or chatting, you must be a registered user and have your own Message Board Account. You can self-register and create your own account instantly by selecting a login name and password and providing some additional information such as your real name and email address. You should choose a login name and password that is easy for you to remember (note this down in your diary for future reference). If you do not have an email address type MCA Online email address in this field - [mca@vu.edu.au](mailto:mca@vu.edu.au)



### Tip

When selecting your login name and password, keep in mind the following:

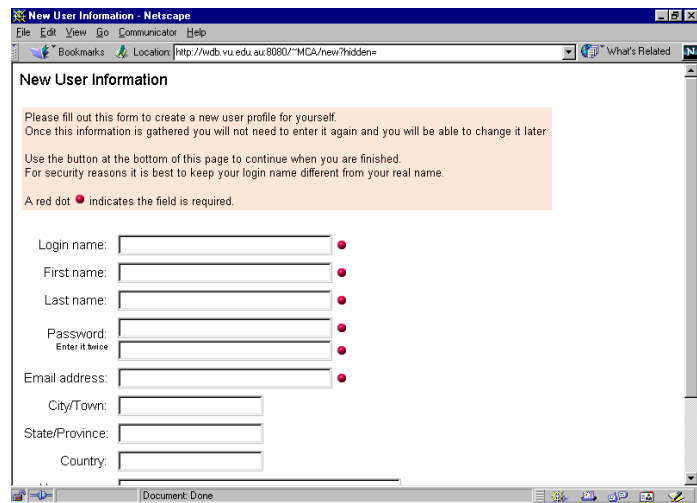
- your login name and real name should be different
- your password should be different from your login name and you should keep it secure
- your login name must be unique so you may be asked to use a different login name.

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## Activity 1.1: Registering as a new user with MCA Online Message Board

This activity will help you create an account with MCA Online message board. Once you have created an account for yourself, you can go to Message Board directly and participate by reading and posting messages. Follow these steps:

1. Open MCA Online Home Page by typing [www.staff.vu.edu.au/mcaonline](http://www.staff.vu.edu.au/mcaonline) in your browser goto field and press Enter.
2. Click on Message Board button on MCA Online Home Page
3. Click on the Registration Form link. The New User Information form appears
4. Follow the directions on this page and fill in the required blanks (marked with red dots). If you do not have an email address type [mca@vu.edu.au](mailto:mca@vu.edu.au) in the Email Address field.
5. You may leave the city, state, country and home page fields blank.
6. Choose Yes for Use Frames option.
7. Click on Create button to finish the registration process. If your login name is unique, WebBoard creates the account and displays the main WebBoard page. If your login name was already being used or some other information was missing, you must complete the form again and resubmit it.
8. Note down your login name and password in your diary for future use.



New User Information - Netscape

File Edit View Go Communicator Help

Location: <http://web.vu.edu.au:8080/~MCA/new?hidden>

**New User Information**

Please fill out this form to create a new user profile for yourself.  
Once this information is gathered you will not need to enter it again and you will be able to change it later.

Use the button at the bottom of this page to continue when you are finished.  
For security reasons it is best to keep your login name different from your real name.

A red dot indicates the field is required.

Login name:

First name:

Last name:

Password:   
Enter it twice

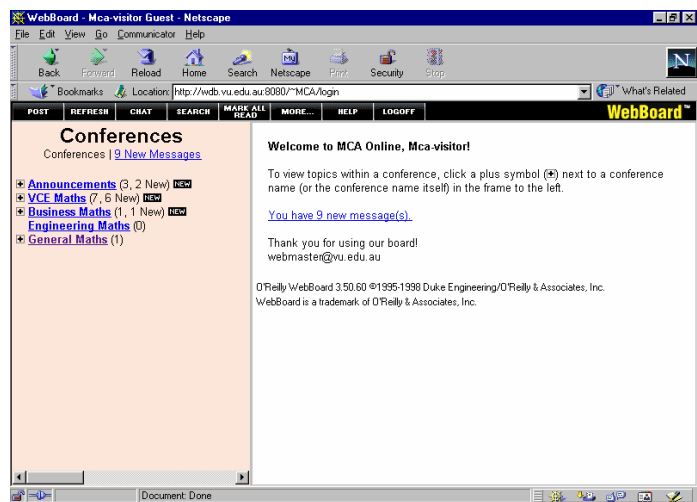
Email address:

City/Town:

State/Province:

Country:

Document: Done



WebBoard - Mca-visitor Guest - Netscape

File Edit View Go Communicator Help

Back Forward Reload Home Search Netscape Print Security Stop

Location: <http://web.vu.edu.au:8080/~MCA/login>

POST REFRESH CHAT SEARCH MARK ALL READ MORE... HELP LOGOFF

**WebBoard™**

**Conferences**

Conferences | [9 New Messages](#)

- Announcements (3, 2 New) [New](#)
- VCE Maths (7, 6 New) [New](#)
- Business Maths (1, 1 New) [New](#)
- Engineering Maths (0)
- General Maths (1)

**Welcome to MCA Online, Mca-visitor!**

To view topics within a conference, click a plus symbol (+) next to a conference name (or the conference name itself) in the frame to the left.

[You have 9 new message\(s\).](#)

Thank you for using our board!  
webmaster@vu.edu.au

O'Reilly WebBoard 3.50.60 ©1995-1998 Duke Engineering/O'Reilly & Associates, Inc.  
WebBoard is a trademark of O'Reilly & Associates, Inc.

Document: Done

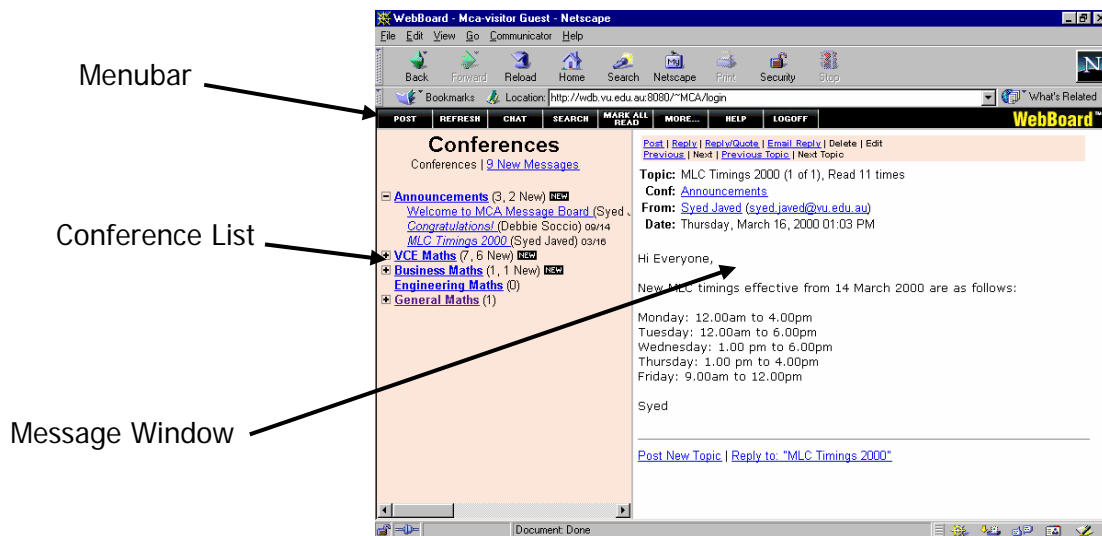
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## Working with the Message Board

Before you start posting messages and participating in chat sessions, you'll want to take a few minutes to become familiar with Message Board's layout and basic operation, including navigation and functionality. Once you've successfully logged in, either as an existing user, new user, or guest, you will see the board's main page, where most Message Board activity occurs.

Typically, a board's main page has three main activity areas, which are listed below:

- **The conference list** (left frame) displays the conferences, topics, and messages. Here you will see conferences such as Announcements, VCE Maths, Business Maths, Engineering and General Maths. A + sign next to the conference name suggests that there are messages within that conference. You can click on the + sign to view a list of messages.
- **The menubar** (top frame) has buttons for using Message Board's commands and features.
- **The message window** (right frame) is the working area where information and forms are displayed. For example, the message window is where you read and post messages, complete user profile information, and execute searches.



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## Browsing Conferences, Topics, and Messages

Before you start posting messages, take a few minutes to browse through the conferences, just as you would browse through several books before selecting one for complete reading. Looking through the conferences, topics, and messages gives you a good idea of what information is on this board, as well as how others are presenting information.

The Conferences list shows all the conferences on this board. An expansion box (+ icon) to the left of a conference name indicates that the conference has topics and messages. The numbers in parentheses to the right of the conference name tells how many total and how many new messages are in it. Conferences with new messages have a NEW icon to the right of the conference name.

To display the topics in a conference, click the conference name or the expansion box. You can expand one conference at time. When you expand another conference, the previous topic list collapses. Or, you can close the conference list by clicking the expansion box again

An expansion box to the left of the topic name indicates that this topic contains more than one message. Topics and messages both have hyperlinks that you can click to open them in the right frame. To the right of each topic and message is the poster's name and date. The poster's name is also a hyperlink to that person's profile.



### Tip

You can get an email notification of messages posted on this Message Board. Simply login to Message Board and choose More menu from the toolbar. Click on Email notify and place a tick on conferences you wish to receive email notification. Choose Save.

From now on any messages posted on selected conferences will be automatically forwarded to your email address.

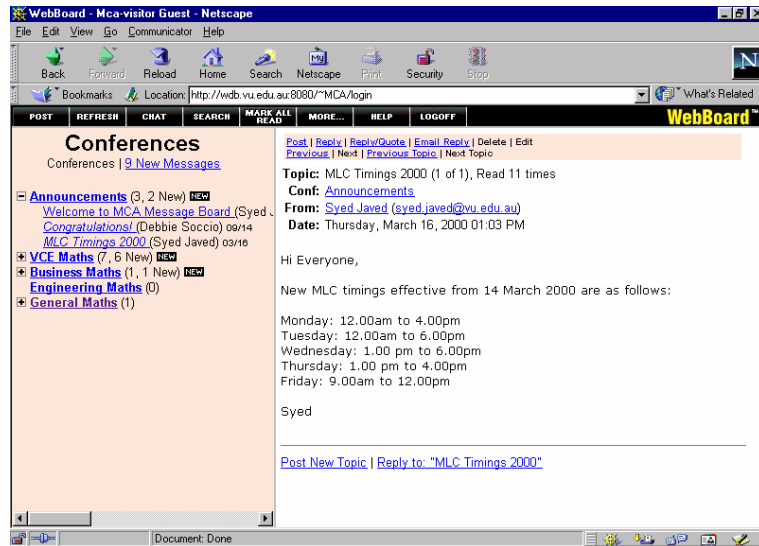
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## Activity 1.2: Reading a Message and Replying

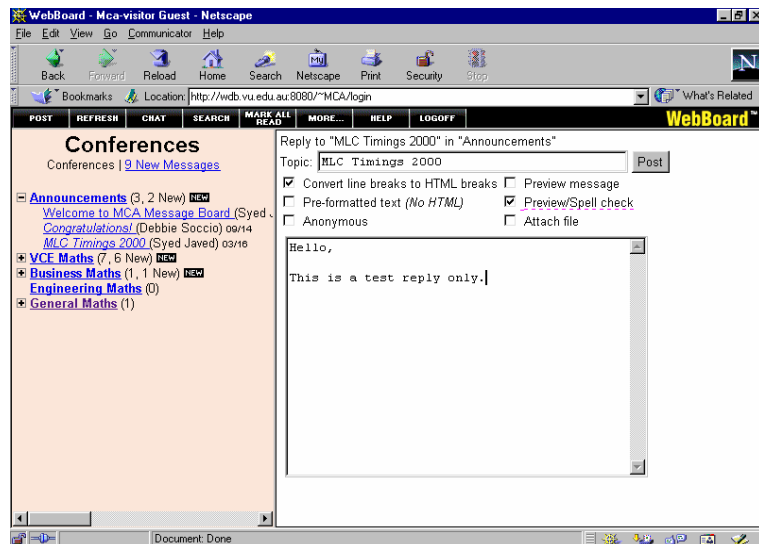
In this activity you will open and read a message posted in the Announcement conference.

1. Log on to MCA Message Board. You will need to use your User Name and Password for the account you created in Activity 1.
2. From the Conferences list, click on the Announcement conference or click the expansion box (+ icon) next to it.
3. Locate the topic MLC Timings and click on its name. The message and replies are displayed in the message window.



4. The message displays in the Message window. You may need to scroll to read the entire message(s).

5. Click on the link 'Reply to MLC Timings' at the bottom of the message window. A new form will open in place of message.



6. Type a short reply in this window. You may tell us about what timings suit you most to visit the MLC at Footscray campus.
  7. Click on the Post button next to topic heading at the top of the message. This will take you to a preview window, just in case you needed to change anything.
  8. Click Post button to send your reply on message board.
-

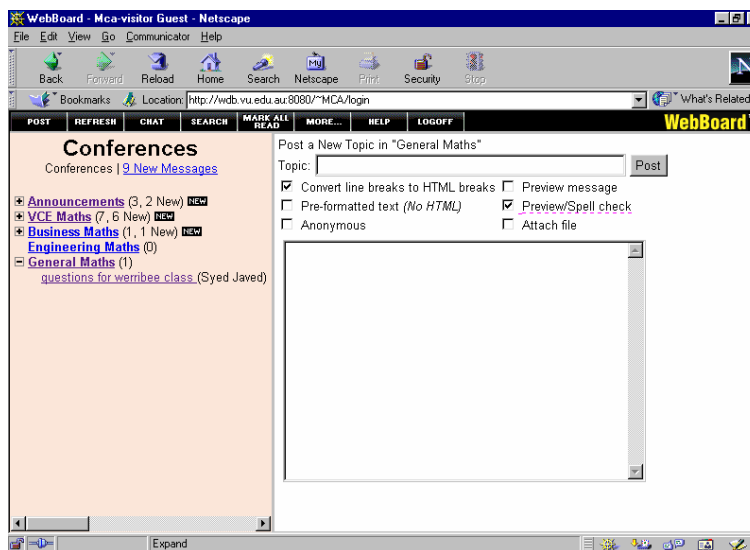
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## Activity 1.3:

### Post a new topic message on the message board

When you post to a conference, you are either adding to a current topic or starting a new topic. If you have something new to contribute or ask such as a comment or a question then you can start a new topic. If you are replying to someone's question or posting then you do not need to start a new topic. You simply open the message and choose reply to message option. The following activity describes how to post a new topic message.

1. Log on to MCA Message Board. You will need to use your User Name and Password from the account you created in Activity 1



2. Select a conference by clicking the conference name or expansion box (+ to the left of the conference name).
  3. Click on Post button from the Message Board menubar
  4. Enter the new topic name in the Topic field. Keep the topic name short. It should give a clear idea of what message is about - e.g. help needed with algebra, how to use MCA chat, where can I find VCE questions? Etc
  5. Type in your message. When you complete your message, click Post. Depending on which options you have selected, Message Board either posts your message immediately or allows you to preview it (with or without spell checking)
  6. Preview the message for any spelling errors and after correcting click on Post button.
-

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## Logging Off

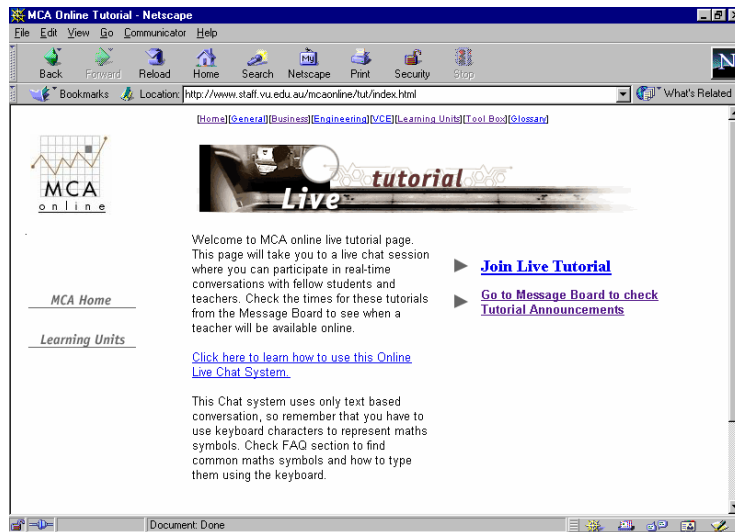
When you are finished with your Message Board session, you can simply point your browser at another site on the Web or you can officially log off Message Board. The Logoff button in the menubar takes you to MCA Online Home Page. If you wish to come back to Message Board, simply click on Log in a User button from message board page. You will be taken directly to the Message Board. The browser remembers your user id and password.

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## MCA Online Live Tutorial and Chat

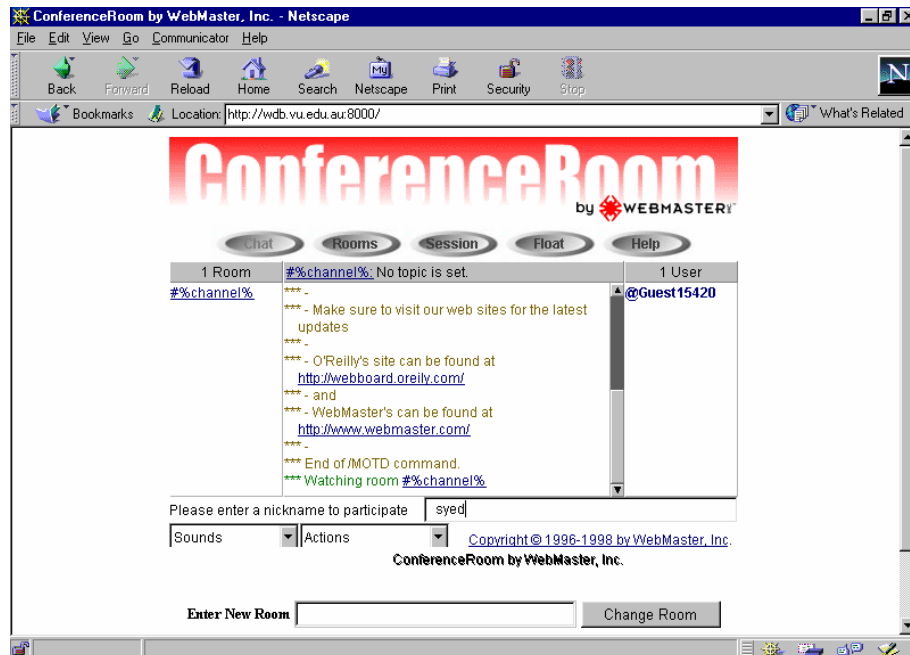
The MCA online Live Tutorial facility offers teachers and students to interact in real time using a Java based conferencing client. This conference uses only text-based chat. It is similar to many Internet based chat systems such as YAHOO chat and MSN chat. You will need to find out chat times from Live Tutorials page to know what is the best time to log in to chat session.



Some useful tips for participating in online tutorials sessions are given here. Follow these tips to make best use of online chat sessions:

- In online chats you need some practice on your keyboard so that you can type your sentences quickly. Become familiar with the keyboard and improve your typing speed.
  - Use abbreviations and shortcuts to say most common phrases.
  - Type your commonly used phrases and questions in a program such as Notepad or Word before joining chat session. Keep your Word file open while chatting. Copy and paste blocks of text from word file to online chat window as needed.
-

In using the Conference Room you can create new rooms and have multiple chat windows open for different rooms. Type a name such as 'private' in the enter new room field and click on the button change room. You will now be talking in this new 'private' room. If you wish to move to another room, double click on the room's name in the chat window. A new window will open up for your chat session. In this way the program allows you to create new rooms and chat with different people without being distracted by others. But, for the purposes of MCA chat sessions on maths we will be using only one chat window.



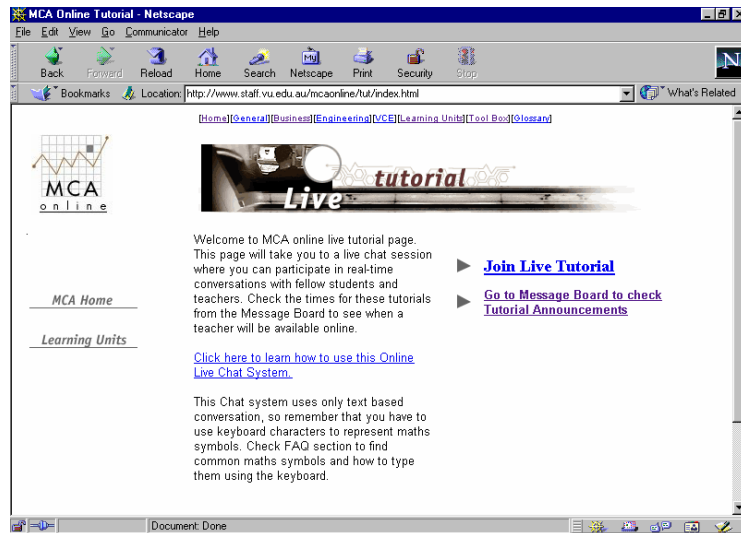
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## Activity 1.4:

### Join and participate in an online live tutorial

In this activity you will take part in a live chat session at MCA website. If you are doing this activity on your own please check live chat times to know when next chat session is scheduled. You can check these times by visiting Live Tutorials page or by going to Message Board and checking online chat announcements. If you come to chat at other times there may not be anyone else to chat with.

1. Open MCA Online website and click on Online Tutorials link. This link will take you to Live Tutorials page.
2. Click Join Live Tutorial link to open a chat conference room. The Conference Room for chat will open in a new browser window in a few seconds. Your browser must be Java capable for this chat feature to work. You must have Netscape or Internet Explorer version 4.0 or above for this chat facility to work properly on your computer.
3. Type your first name in the text field next to the words, 'Please enter a nickname to participate' and press Enter key. This will make your name appear in the user column.
4. Type your message in the text entry field and press enter key. Your message will be posted on the chat window.
5. Continue your discussion and use Actions and Sounds prompts from pull down menu located just under the text entry field.



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# Assessment Task 1

This assessment task is based on your understanding and knowledge from Section 1 of this module. Your tutor will give actual date and time for completing this assessment task to you.

## **Task 1a**

Visit MCA Online message board and read the problem posted for your group in Assessment Conference folder. Your task is to follow instructions to solve the problem and complete the task. After you have completed the task, log in to MCA Online Message Board and post your answer in the Answer Box Conference folder.

In order to complete this task you may need to use MCA online resources from Toolbox and Learning Units sections.

## **Task 1b**

Visit MCA Online Message Board and read the messages posted in Tutorial Times conference folder. Find the timings for the next online tutorial session by reading recently posted messages.

Your task is to join in and participate in online chat at the specified time. In order to complete this task you may need to go over Activity 4 from Section 1.

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## SECTION 2: Working with Maths Problems

When you have completed this section, you should be able to perform and demonstrate the following learning outcome in accordance with the assessment criteria and conditions listed below.

### **Learning Outcome:**

Identify appropriate paths for solving problems at MCA Online

### **Assessment Criteria:**

4. Follow a learning unit to understand basic maths concepts
5. Solve new problems using webmath links
6. Locate Dr Math responses to solve maths problems

### **Conditions:**

Access to an environment conducive to computer assisted learning.

During learning and assessment activities students will have access to MCA Online Website.

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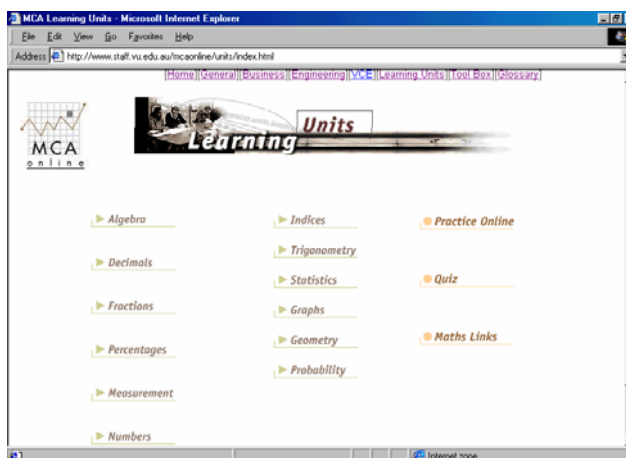
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# SECTION 2: Working with Maths Problems

To work with maths problems at MCA Online you will need to go to the Learning Units section. The Learning Units section gives you direct access to simple explanations and examples on common maths topics. The difficulty level of maths topic is maintained at pre VCE range. The topics covered in this section include algebra, decimals, fractions, numbers, measurement, indices, percentages, geometry, trigonometry, statistics, graphs and probability.

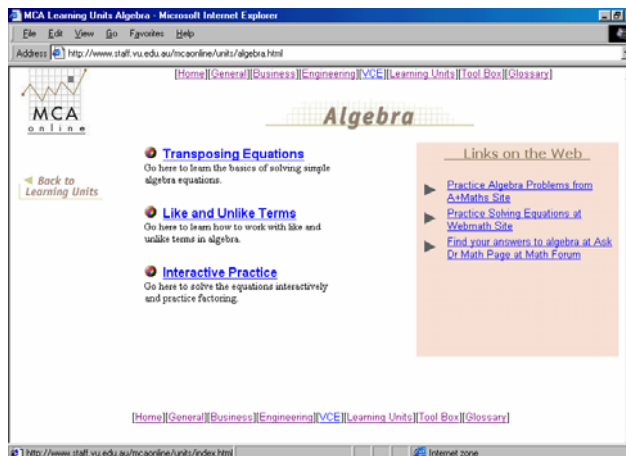
You may choose to follow a particular learning unit such as Algebra in more detail.

You can access individual maths unit from a number of pages but the quickest way to get to your selection is via the Learning Units page.



## Learning Units

Each learning unit is comprised of two or more sub-units and provides access to relevant websites on that topic for further practice and exploration. If you are visiting Algebra unit, you will notice that it offers you access to Transposing Equations, Like and Unlike Terms and Interactive Practice sub-units. It also provides access to practice links from other websites.



In any learning sub-unit section you will find the actual topic description and tips on how to solve problems based on that topic. For example, when you visit Algebra learning unit, you can choose to go to Transposing Equations sub-unit. In this section you will find a simple technique of transposing equations explained clearly. You should click on Examples, Practice Questions and Have a Go links to explore the topic in more detail and try some questions.

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## Links on the Web

From each learning unit's page, MCA online provides links to websites offering more learning activities on the topic. These learning activities come from the following sources:

### Webmath

Activities offered via this link are interactive and you are able to solve your maths problem by entering it in the required format. Webmath solves your problem in a detailed step-by-step method.

Sometime these steps may appear repetitive and unnecessary. Being an automated program Webmath is not as intelligent as a real teacher, but gives correct solutions. When entering your own problems at Webmath pages you must stick to the format suggested by Webmath. Have a look at the examples suggested by Webmath and use the following hints when typing your problems:

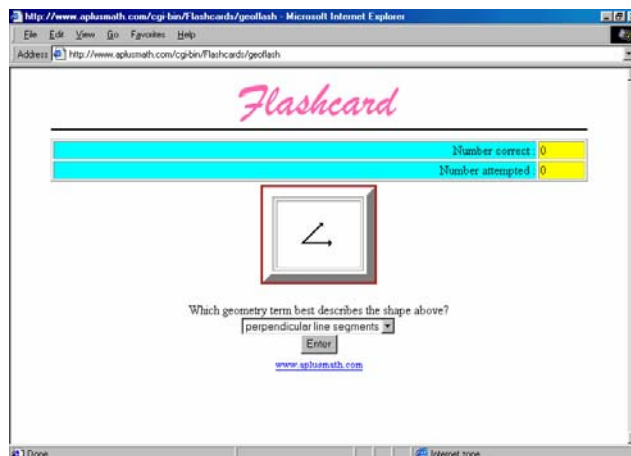


- The ^ symbol means exponent. So, for example,  $x^2$  means  $x^2$ ,  $5^2$  means  $5^2$  and  $3.2^2$  means  $3.2^2$ .
  - + means plus, - means minus, / means divide, \* means multiply
  - In most cases, you don't need to type the \*, Webmath automatically knows when to multiply
  - Any keyboard letter may be used as a variable, like  $x$ ,  $y$ ,  $z$ ,  $a$ ,  $b$ , etc.
  - You may use grouping symbols, like ( and ), [ and ], or { and }.
-

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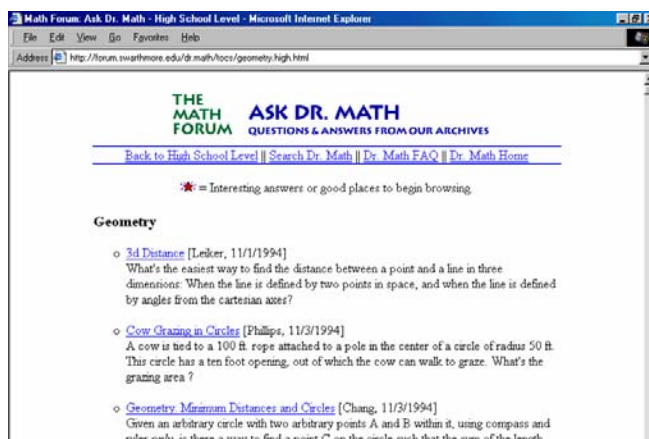
## A+ Math

Activities offered via A+ Math links are interactive practice exercises. In these activities maths problems are presented to you and you have to select or type the correct response for the problem. In some topics you will need to select the type of problems you need to practice before going on to practice flashcards and doing the problems. Each problem is corrected by the program and your score is displayed in a score window. Note that A+Maths activities do not have the option to type your own problems.



## Ask Dr Math

This link provides direct access to past questions and answers by expert maths teachers from Ask Dr Math website. There is a long list of questions and answers on each topic and you will need to scroll down this page to see more questions. The topics are arranged according to grade levels. Most questions and answers archived on this website are based on real problems posted by students around the world. It is recommended that you spend some time browsing through the questions and answers on selected maths topics. It helps to develop your awareness on concepts related to that topic.



The activities on following pages are aimed at increasing your skills and knowledge in solving maths problems using Learning Units section.

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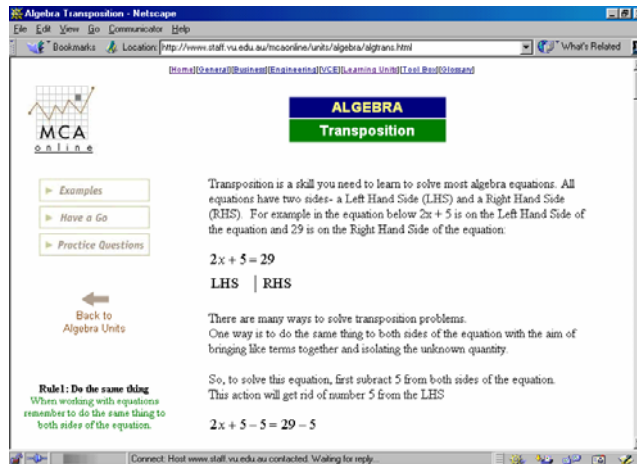
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## Activity 2.1:

### Follow a Learning Unit to revise basic concepts of Algebra Transposition

In this activity you will go through a learning unit on algebra transposition to revise your maths concepts and to become familiar with learning unit path on MCA online. The steps shown in this activity are generic and can be used on other learning units as well.

1. Go to Learning Units sections of the MCA Online website.
2. Click once on Algebra hotlink to go to algebra learning units page
3. Click on Transposing Equations link to go to the subunit - Algebra-Transposition
4. Read the introduction section. Scroll down if necessary.
5. Click on Return to Top hotlink to go back to top of the page.
6. Go to Examples section by clicking on Examples hotlink at the left margin of the page. Follow the examples and click on Return to Top hotlink to get back to top of the page
7. Click on Have a Go hotlink at the left margin of the page to go to Have a Go section. Try solving the problems. You may use a pen and paper at this stage, if needed.
8. Click on See Solution hotlink to go to solutions of these problems and compare your working with the one on MCA Online. Click on Return to Top hotlink to go back to the top of the page.
9. Go to Practice Questions section by clicking on the Practice Questions hotlink at the left margin of the page.
10. Attempt practice questions. Use pen and paper, if necessary.
11. Click on the drop down button at the Answer hotlink. You will see correct answer displayed in the Answer box.
12. Go back to top and click on Return to Algebra Units hotlink at the left margin of the page. You are back the Algebra units home page.



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## Activity 2.2:

### Solve Maths Problems Using MCA Online links on the web

In this activity you will use an interactive Webmath page to enter your maths problem on compound interest and see how it can be solved. The Webmath will actually solve the problem and show you the working out. The problem you are asked to solve is as follows:

A \$10,000 investment attracts interest of 10% p.a. compounded quarterly over a 10-year period. How much interest will have accrued at the end of that period?

Follow these steps to see how this problem can be solved:

1. Go to Learning Units sections of the MCA Online website.
2. Click once on Percentages hotlink to go to Percentages learning unit page.
3. On Percentages page click on Compound Interest Problems hotlink from Links on the Web section. The Webmath's Calculating Compound Interest page will open in a new browser window.
4. Scroll down to view compound interest data entry fields for principal amount, interest rate, compounding period and number of years.
5. Enter your data from question above in correct data fields and press Find my new amount of money button.
6. The program solves your problem and returns a page with complete solution. Scroll down this page to view the complete solution. The problem is solved in a step-by-step method to give you an understanding of the method and then at the end the formulae for solving compound interest problems is used to show that both methods provide same results.

Webmath.com: Calculating Compound Interest - Netscape

principal amount. It is **compound** interest, as opposed to **simple** interest, because at the next interest interval, the new interest is calculated from the **principal+last interest earned**. That is, your principal grows each time it earns interest.

What amount of money is loaned or borrowed? (this is the principal amount)	\$10,000 Example: 25,000
What is the <b>annual interest rate</b> (in percent) attached to this money?	10 % per year Example: 12.5
How many times per year is your money compounded?	4 time(s) a year
After how many years do you want to know what your principal will be?	After 10 years

Find my new amount of money!

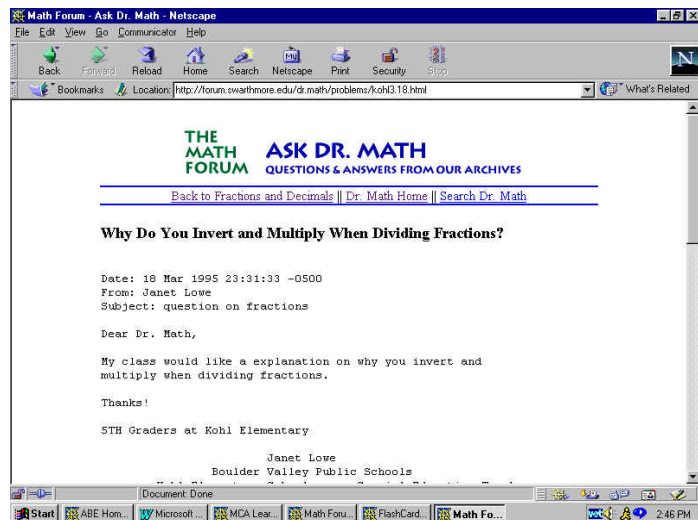
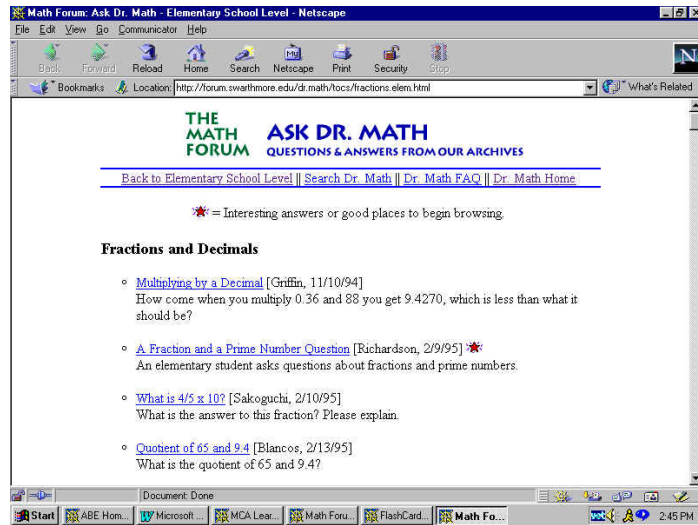
Document: Done

Start ABE Home Page MCA Learning Un... Microsoft Word... Webmath.com... 12:23 PM

## Activity 2.3: Search and find solutions from Ask Dr Math archives

In this activity you will visit Ask Dr Math questions and answers archive. This website has an extensive collection of maths questions and answers categories topically. In this activity your task is find an explanation for the process of dividing fractions.

1. Go to Learning Units section of the MCA Online website.
2. Click on Decimals hotlink to go the Decimals learning unit page.
3. On Decimals page click on Ask Dr Math about Decimals hotlink listed under Links on the Web heading. Ask Dr Math page on the topic of decimals will open in a new browser window.
4. Browse through the listed topics to find questions relating to dividing fractions.
5. Click on underlined topic name to open the question and answer page. This page opens similar to an email text.
6. Read a number of replies related to the problem of dividing fractions.
7. Think of a question similar to one posted on Ask Dr Math pages and post it on MCA message board.



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## Assessment Task 2

This assessment task is based on your understanding and knowledge from Section 2 of this module. Your tutor will provide the actual date and time for completing this assessment task to you.

In this task you will use your maths knowledge and resources available in Learning Units section of MCA Online to answer questions given to you by your tutor. The Questions Sheet contains 10 maths problems. Answer all questions using MCA online pages where appropriate and submit your answers on an answer sheet to your tutor.

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## SECTION 3: Using Tools and Resources

When you have completed this section, you should be able to perform and demonstrate the following learning outcome in accordance with the assessment criteria and conditions listed below.

### **Learning Outcome:**

Locate and use online maths tools and resources

### **Assessment Criteria:**

7. Find Maths terms in online glossaries
8. Convert measurement units using online calculators
9. Operate an online scientific calculator

### **Conditions:**

Access to an environment conducive to computer assisted learning.

During learning and assessment activities students will have access to MCA Online Website.





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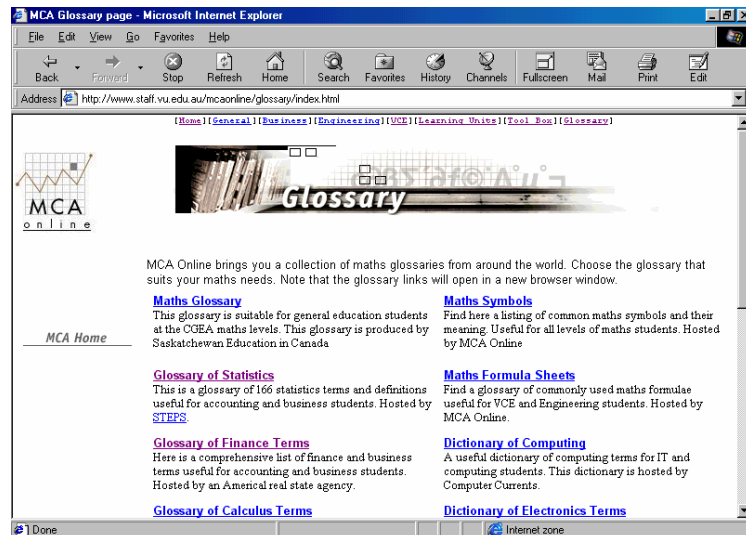
# SECTION 3: Using Tools and Resources

While working with maths problems many times you need to use special maths tools and resources to help solve the problem. MCA online makes a number of very useful tools and resources available to you via the web. You can access an online scientific calculator, use conversion tables to change several imperial and metric units of measurement, look up difficult maths terms in a glossary of terms or access symbols and formula pages to look up symbols and formula cheat sheets.

You should note that these maths tools and resources are there to help you solve real maths problems. So, when you read a maths problem and find a maths word that doesn't make sense to you, it is a good idea to look up the glossary of terms and find the meaning of that term. Similarly, while working on problems using indices if you don't know how the index law will apply in this particular case, go upto Formula sheets in Toolbox and have a quick look at the index laws summary. Now let us look at these maths online tools and resources closely.

## Glossary of Terms

There are several online glossaries for maths that help you to find the meaning of commonly used maths words. The Glossary page from MCA Online provides links to these glossaries. When you open a glossary page you will see an alphabetical index of listed words. The letters A to Z are hypertext links. Click on the letter that begins your word and you will be presented with terms beginning with that letter. If necessary, scroll down the page to find your word. If your word is not listed in this glossary try another glossary from the Glossary page. It is like using a dictionary, you may have to look at several glossaries to find meaning of some specialised terms. MCA online provides links to some specialised glossaries for Finance, Statistics, Calculus and Computing terms. Try these for technical terms from specialised fields. Note that each glossary opens in a new browser window and you can return to MCA Online Glossary page by choosing it from the task bar at the bottom of your monitor screen.



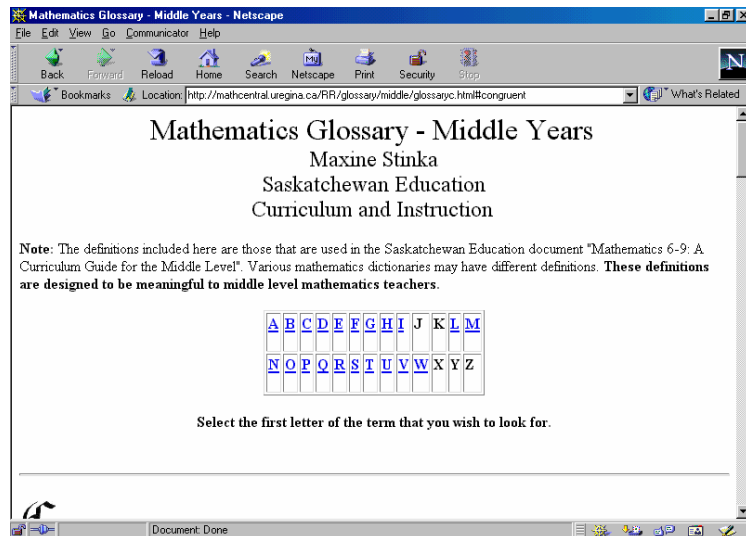
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## Activity 3.1: Find Maths terms in online glossaries

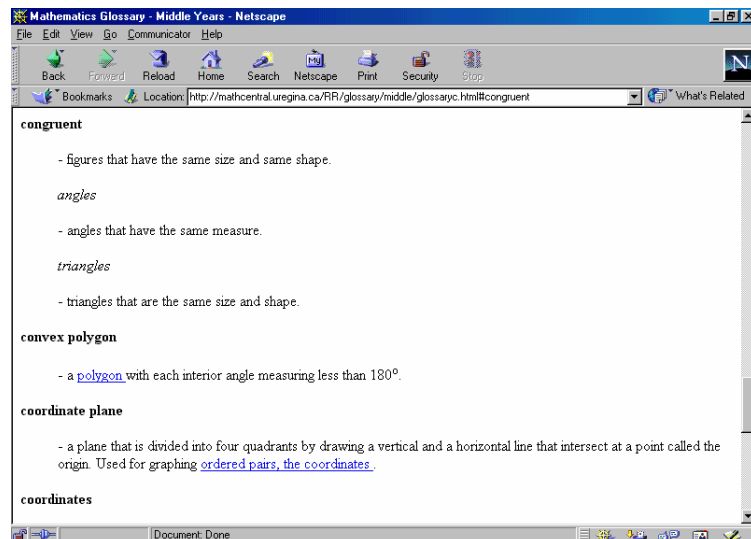
In this activity you will use online glossaries to find meanings of following maths terms:

- a. congruent
- b. histogram

1. Go to Glossary section of the MCA Online website.
2. Click on Maths Glossary link on this page. This will open Mathematics Glossary-Middle Years in a new browser window.
3. Click on letter C to move your page to the section where the term congruent should be listed.



4. Scroll down to see more listings under C until you find Congruent. Read the meaning and note it down in your notebook.
5. Scroll back to top of the page and click on letter H to go to the section where Histogram should be listed.
6. Scroll down to see more listings under H until you find Histogram. Read the meaning and note it down in your notebook.

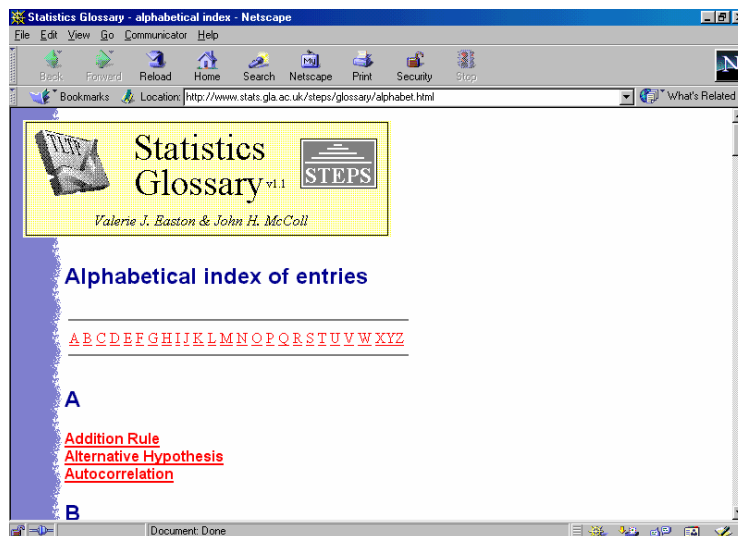


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The term Histogram comes from Statistics, now we will look up the meaning of this term in the Statistics glossary.

7. Close the browser window for Mathematics Glossary- Middle Years and return to MCA Online Glossary page.

8. Click on Statistics Glossary link. This will open Statistics Glossary Page in a new browser window.



9. Click on letter H to move to the section listing words under H.

10. Find the word Histogram and click on it. You will see a page with Presentation terms used in Statistics.

11. Scroll down this page to find Histogram and click on the word.

12. A detailed explanation of the term Histogram is presented. This is a more detailed meaning of the term Histogram with illustrations.

13. Close the browser window after reading. This will return you to MCA Online Glossary page.

## Extension Activity

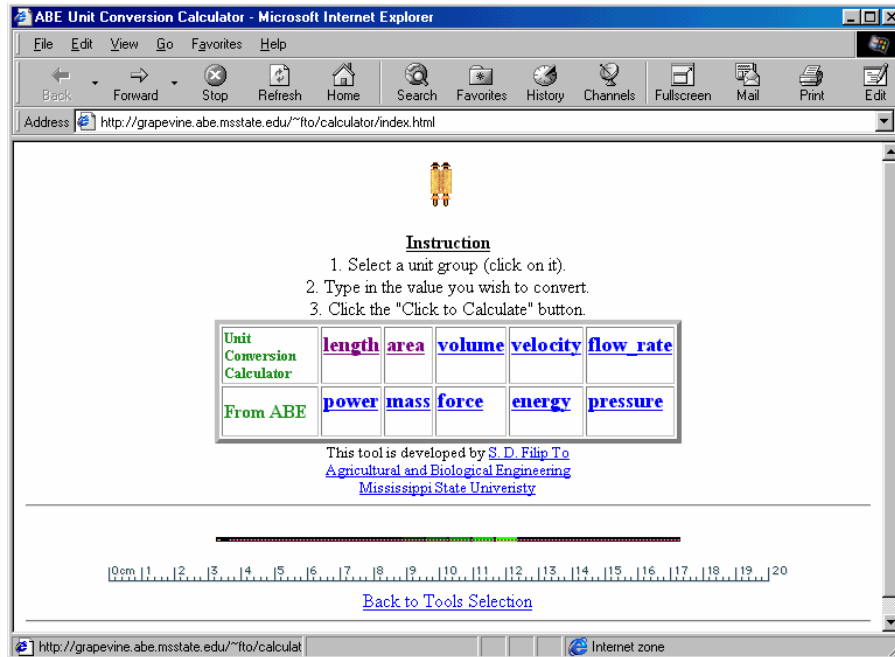
Using Online Glossaries find the meaning of following maths terms:

Annuity, Box Plot, Vertex, Polynomial and Median.

---

## Units Conversion

The units conversion tools accessible from MCA Online can be used to convert measurement units. These calculators are available from Tool box section and offer conversion calculators for length, area, volume, mass, power, force, energy, velocity, flow rate and pressure. A separate Volume Calculator page offers volume calculation for shapes such cylinders, cones, spheres, pyramids and boxes.



The online calculators use javascript programming to give you instant results. The unit conversion window shows large numbers in a special scientific notation. For example 5000 will be shown as 0.05e+6 meaning the same as  $0.05 \times 10^6$ . You will need to use your knowledge of scientific notations to convert some of the results into natural numbers.

Note that there are differences in British and American unit measurements.

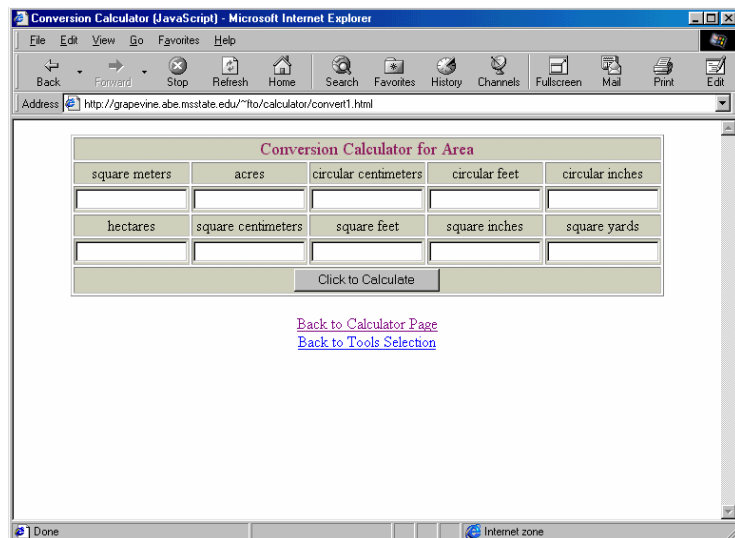
Activities on following page will show you how to use unit conversion calculator.

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## Activity 3.2: Using a unit conversion calculator

In this activity we will use an area conversion calculator to convert 50 hectares into square metres. We will need to use our knowledge of scientific notations to interpret the results.

1. Go to Tool Box section of the MCA Online website.
2. Click on Units Conversions link from the contents frame located at the left of open window. A new browser window with links to various conversion calculators will open.
3. Click on Area link to the conversion calculator for area.
4. In the Area Calculator window click once in the hectare box and type 50.
5. Click on click to calculate button to execute your calculation.
6. Note the answer in the square meters box. It shows  $0.5e+6$ . This equals to  $0.5 \times 10^6$  or 500,000 square metres.
7. Just to check your calculations, click once in the square meters box and type 500000 there.
8. Click on click to calculate button to execute the calculation.
9. Check the hectare box. You should see 50 in this box.
10. Close the window to return to MCA Online Tool box.



This way of working help you backtrack and check the accuracy of your calculation.

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## **Extension Activity:**

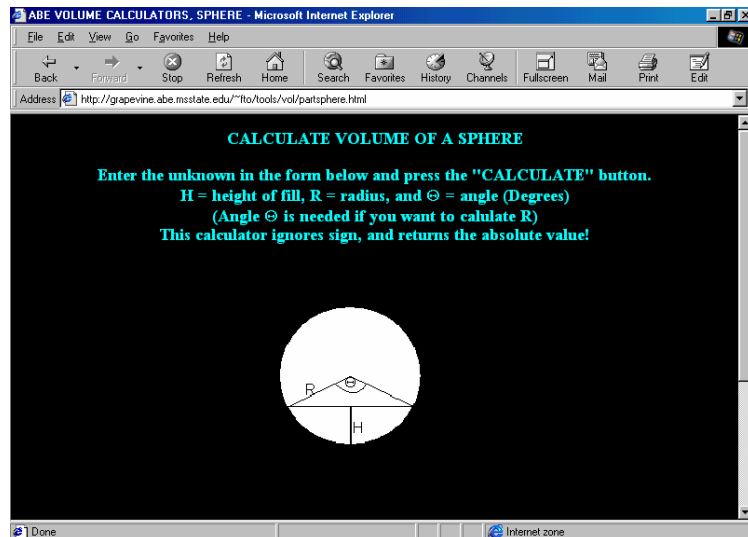
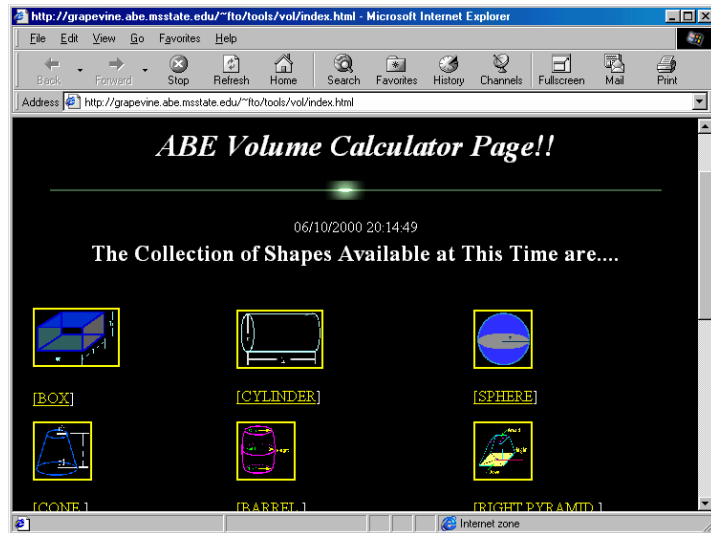
- a. Convert 7 Stones into Kilograms using Mass conversion calculator.
- b. Find how long in 5 Miles in Meters.
- c. Calculate how many litres would there be in 5 gallons of petrol.

---

## Activity 3.3: Finding volume of a 3-D shape

In this activity we will use the volume calculator link to calculate the volume of a sphere (ball) with a radius of 12cm.

1. Go to Tool Box section of the MCA Online website.
2. Click on Volume Calculator link from the contents frame located at the left of open window. A new browser window with links to volume calculators will open.
3. Click on the sphere link to open the volume calculator for sphere
4. Scroll down (if necessary) to see fill in fields for angle, height and radius.
5. Fill in the values of angle as 360 (because we want the volume of a fully filled ball) and radius as 12
6. Click on calculate button to see the value of volume in the volume field (7238.229473870883)



### Extension Activity:

- a. Calculate the volume of 20cm diameter ball when it is only half filled.
- b. Calculate the volume of a cylinder 100 cm long and 10cm in diameter.

---

## Online Calculator

The Tool box at MCA Online contains a calculator for your basic calculations. The calculator javascript programming to work on the web. You can use your mouse to enter calculations on four basic operations and special buttons for calculating Pi, square root and trigonometric functions such as sin, cos and tan. It is a base level scientific calculator and does not have many additional features found on hand-held scientific calculators. Though it is handy on the web when you don't have access to a hand-held calculator.

The online calculator keys work as follows:

- + means add
- means subtract
- \* means multiply
- / means divide
- $^2$  means squared
- $^3$  means cubed
- sqrt means square root
- pi means  $\pi$

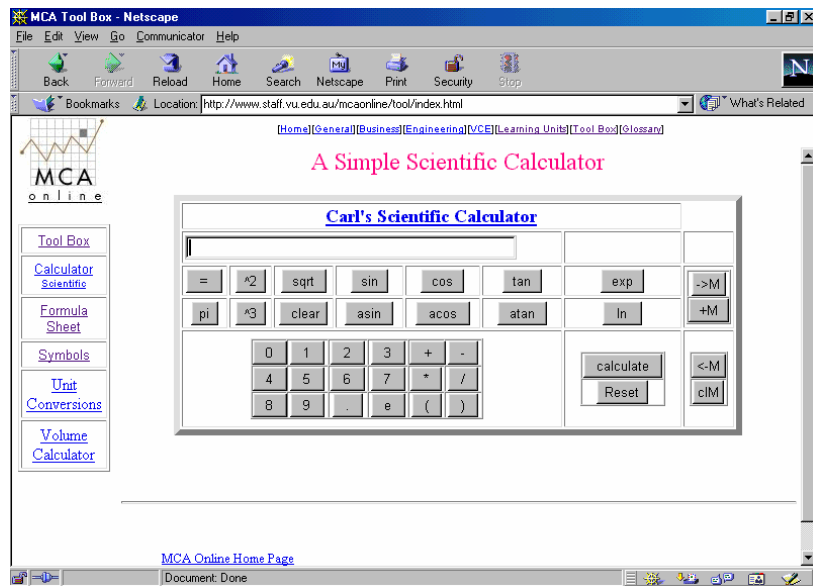
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## Activity 3.4:

### Calculate volume of a cylinder using online calculator

In this activity we will calculate volume of a cylinder using the formula  $V = \pi r^2 h$ , where V is volume,  $\pi$

Stands for Pi, r stands for the radius of the cylinder's base and h stands for cylinders height. Your task is to calculate the volume of cylinder that has a radius of 9.5cm and a height of 40cm.



1. Go to Tool Box section of the MCA Online website.
2. Click on Calculator link from the contents frame located at the left of open window. A calculator window will open in the right frame.
3. Using keypad on the screen press  $\pi * 4.9 * 4.9 * 40$  , the calculator automatically uses correct value of Pi on the screen.
4. Press calculate button to execute your calculation.
5. The answer is shown as 3017.185584507638 on the computer display.
6. Click on Reset button to erase current calculations.

---

## Assessment Task 3

This assessment task is based on your understanding and knowledge from Section 3 of this module. Your tutor will provide you the actual date and time for completing this assessment task.

In this task you will use maths tools and resources available via the Tool Box section of MCA Online to answer questions given to you by your tutor. The Questions Sheet contains 10 problems. Find answers to these problems using MCA online pages where appropriate and submit your answers on an answer sheet to your tutor.

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# SECTION 4: Using Online Symbols

When you have completed this section, you should be able to perform and demonstrate the following learning outcome in accordance with the assessment criteria and conditions listed below.

## **Learning Outcome:**

Understand symbols and expressions used in online maths

## **Assessment Criteria:**

1. Locate and use maths symbols and formulae to solve problems
2. Solve simple algebraic equations using online interactive links
3. Solve factorising problems using online interactive links
4. Solve interactive Tanagram puzzles

## **Conditions:**

Access to an environment conducive to computer assisted learning.

During learning and assessment activities students will have access to MCA Online Website.

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## SECTION 4: Using Online Symbols

Writing maths on a computer is a challenging task specially when using maths symbols and notations. However with the increase in popularity of computer based maths programs and Internet based interactive maths new standards of writing maths on computer are emerging. This unit focuses on introducing online maths symbols and expressions and using this knowledge in participating in online maths activities.

Use of symbols and expressions is unique to mathematics as a subject. At MCA online website you can find conventional maths symbols and formula lists under Tool box section. The symbols and formula listing contains common mathematical terms and symbols as found in most maths textbooks. If you are looking to find the meaning of a maths notation or symbols, check at Maths Symbols page on MCA online.

Using computer keyboard to write mathematical expressions has resulted in new ways of writing maths. Though unfamiliar to most of us these expressions have been around in computer field for some time and global online communities are adopting these expressions in web based maths writing. MCA online has used following online maths expressions:

<b>Conventional Expression</b>	<b>Online Expression</b>
$3.0 \times 10^5$	3.0 X 10^5
$2^3$	2^3
	sqrt36
	Sqrt(3)/2
$1.07 \times 10^3$	1.07e+3

---

## Activity 4.1:

### Locate and use maths symbols and formulae

In this activity you will practice a task on locating and writing maths expression for interactive online exercises. Your task is to solve a problem based on index laws. The problem is to evaluate:

To solve this problem, first you can look up MCA Tool box for formula sheet on Index Laws.

1. Go to MCA Online Toolbox Page and click on Formula Sheet link to open Maths Formula Sheet 1 in the main frame. Scroll down if necessary to view Index Law-fractional exponents formula. This page will give you some indication of how this problem can be solved.
2. Now go to Learning Units and click on Indices link. This will open Indices learning unit in your browser window.
3. Click on Try More Index Laws Problem from the Links on the Web section of this page. This will open *Webmath* page on *Raising a Polynomial to Some Exponent* page.
4. In Type Your Problem here field carefully type your problem as:

$$(9)^{1/2} - (8)^{1/3}$$

5. Note how this problem is written for online use.
6. Now click on Click here to do the exponent button. In a few moments the page will reload with solution to your problem.
7. Read the solution to your problem. Scroll down the page if necessary. This online calculator solves problems showing every single step involved. You may find that some of these steps are repetitive and unnecessary.

### Extension Work

Try following steps shown in this activity to solve following problems:

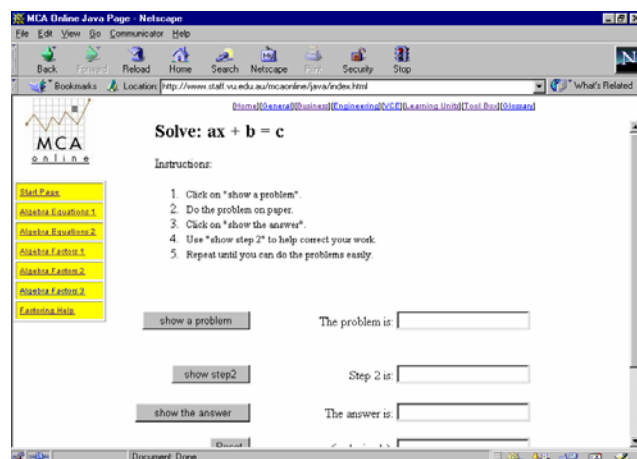
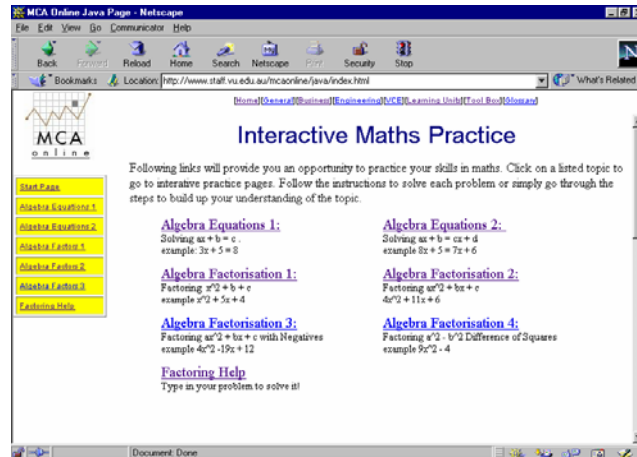
a.  $(x - 3)^2$

b.  $(2x + 1)^2 - (x + 1)^2$

## Activity 4.2: Use interactive practice pages on solving simple equations

This activity promotes learning in solving algebra equations. MCA online practice pages on algebra allow you to follow step-by-step solution of an infinite number of problems. Your task here is to discover algebra rules for solving these problems by following step-by-step solution done by the program.

1. Go to MCA Online Learning Units Page and click on Practice Online link. This will open up a Maths Interactive Practice page on your screen.
2. Click on Algebra Equations 1 link to open to practice  $ax + b = c$  type of equations. Follow on screen instructions on this page to solve the problem.
3. When one problem is solved click on Reset button to erase all entries.
4. Click on Show Problem button to see another problem and follow on screen directions to solve it.
5. Use pen and paper to copy any 5 problems and their step-by-step solution.

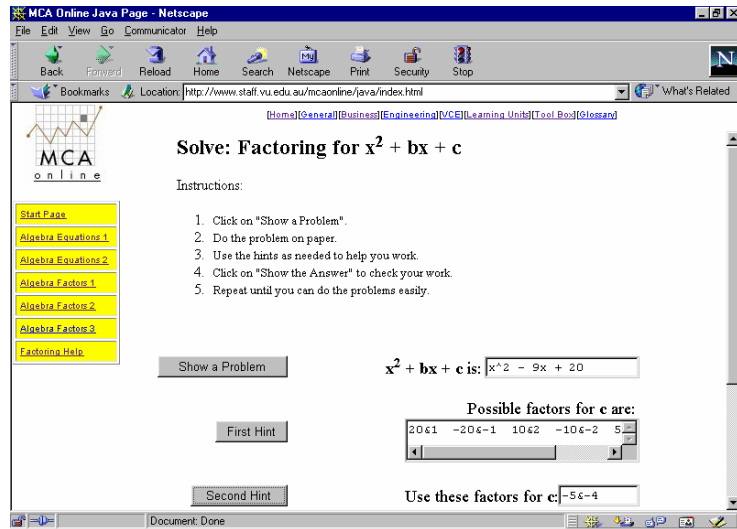


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## Activity 4.3: Use interactive practice for solving factorising problems

This activity promotes learning in factorising for quadratic expressions. MCA online practice pages on algebra allow you to follow step-by-step solution of an infinite number of problems. Your task here is to discover algebra rules for solving these problems by following step-by-step solution done by the program.

1. Go to MCA Online Learning Units Page and click on Practice Online link. This will open up a Maths Interactive Practice page on your screen.
2. Click on Algebra Factors 1 link to open practice exercises on  $x^2 + bx + c$  type problems.
3. Follow on screen instructions on this page to solve the problem.
4. When one problem is solved click on Reset button to erase all entries.
5. Click on Show Problem button to see another problem and follow on screen directions to solve it.
6. Use pen and paper to copy any 5 problems and their step-by-step solution.

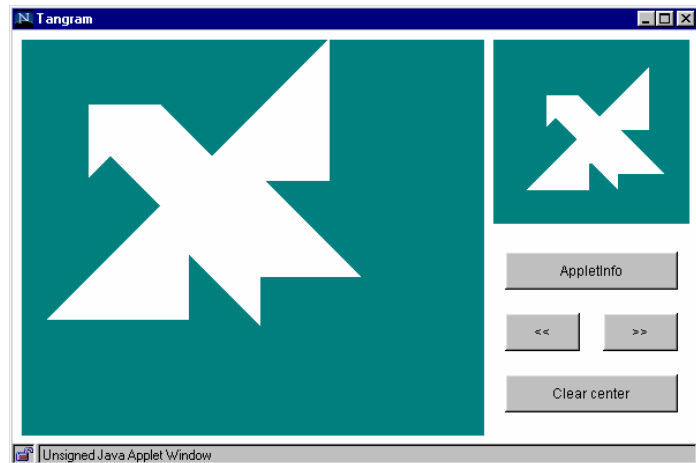
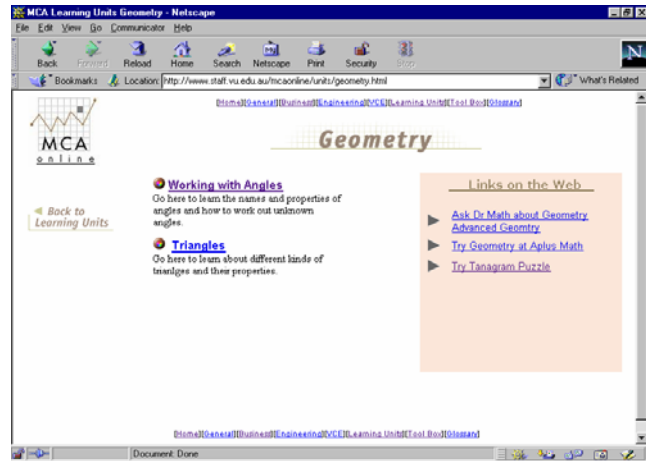


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## Activity 4.4: Practice design skills with Tangram puzzles

In this activity you will use 7 pieces of a square to draw various interesting shapes. This is a design manipulation puzzle based on visual perceptions skills. Instead of moving these pieces on a table surface you will use your mouse to drag and rotate these pieces. Here are the steps:

1. Go to the Learning Units section of MCA Online and click on Geometry link. This will open Geometry unit.
2. Click on Try Tangram Puzzle link under the Links on the Web section. This will open a new browser window with Enhanced Mind Tangram Page.
3. Scroll down Tangram Page and click on Tangram Button in a blue square. This will start a new window with Tangram puzzle pieces.
4. Click on Begin button in the Tangram window to start your puzzle.
5. Drag puzzle pieces using your mouse to draw the shape shown on Tangram screen. Use right mouse click to rotate piece. Use double-click to flip parallelogram piece.
6. Draw the puzzle and make sure that pieces do not overlap.
7. Click on >> button to go to next shape.
8. Draw at least two shapes from the collection.



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## Assessment Task 4

This assessment task is based on your understanding and knowledge from Section 4 of this module. Your tutor will provide you the actual date and time for completing this assessment task.

In this task you will use your maths knowledge and resources available at MCA Online to answer questions given to you by your tutor. Collect Assessment Task 4 Question Sheet from your tutor and answer all questions using MCA online pages where appropriate. Submit your answers on an answer sheet to your tutor.

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# RESPONSE FORM

In order to update and maintain this module your comments would be most valuable to us.

Please make note of any inconsistencies or errors found in the module on this page and send a copy of your findings to us. We appreciate your help in improving this module.

## Section 1

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## Section 3

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## Section 2

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## Section 4

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### Return this Form to:

Project Officer  
MCA Online Project  
Adult Basic Education  
Footscray (Nicholson Campus)  
Victoria University of Technology  
Phone: 03-9284 8873  
Fax: 03-9284 8584