



Module Facelift: Engaging Student Technology Teachers with Maths

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BTechEd Maths T1

- Student Technology teachers - will be teaching
 - Practical stuff (making things with wood, metal,...)
 - Design - computer based activities
 - Engineering
 - Electronics
- Most have Higher Maths (though a few don't)
- Maths T1 content
 - Basics: arithmetic, algebra, trig, geometry, stats, vectors
 - Topics from Higher: trig functions, coordinate geometry, differentiation, logs and exponentials
 - Complex Numbers
- So they've seen it all before -
 - Poor motivation - little engagement
 - Rush to finish "by Christmas"

Maths T1 Resources - to 2010

- CALMAT
 - Available on university labs
 - Downloadable for home use
 - But
 - 16 bit - incompatible with Windows 7
 - Can use Virtual Machine (VM) - but need operating system and some expertise
- TAS - CALMAT's Testing and Assessment System
 - 10 topic tutorials - formative, try as often as required
 - 10 topic tests, open-book but supervised, 1 attempt
- Moodle course
 - Course info
 - CALMAT notes

Maths T1 Resources - 2011-12

- CALMAT
- TAS - CALMAT's Testing and Assessment System
 - Used for 10 topic tests, open-book but supervised
- Moodle course
 - Course info
 - CALMAT notes
 - MathCentre - links, PDFs
 - BBC, PurpleMath, etc. - links
- Experimental Moodle Course
 - Online tests similar to TAS tutorials
 - Not all questions
 - Not all topics

Maths T1 Resources - 2012

- Problem:
 - CALMAT and TAS available on 1 lab for this year only
- Solution:
 - Add more learning material as links and downloads
 - Create QTIv2.1 questions for each topic (and most subtopics)
 - Convert all topic tests to QTIv2.1 standards-based assessments
- Usage:
 - Students practise individual questions after using online learning materials
 - Tests made available during class times, marks collected only for attending students

But that's not all...

- That gives us a reasonable alternative to CALMAT
- There's still a motivation problem...
- “Why do we do this Maths stuff anyway? - we've got Higher...”
- Well...
 - To make sure **you** can do it
 - And if you can do it, to help your classmates who can't
 - To improve your understanding of Maths (the joining up of ideas)
 - To provide you with a resource to refer to later in your course
- All of which should
 - Make it easier for you to explain it to pupils

The “Social” Side...

- News forum
 - Mostly Sue announcing new resources & course arrangements
- Topics forum
 - Problem topics - “Can you explain this in class?”
 - Question bugs
 - Questions about questions (& other resources)
- Wiki
 - Additional resources
 - “I found this really useful...”
- E-Portfolio - Mahara
 - Record of learning
 - Resource for reference - “How do you...??”

QTI in Moodle 2 - Course Page

Maths T1

Navigation

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[Use sin or cos to find the hypotenuse](#)

[Use tan to find a side](#)

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Turn editing on

Go

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- [Maths T1 Course Information 2012-13](#)
- [Maths T1 Introduction \(slides\)](#)
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- [Topics Wiki](#)
- [Topics Forum](#)
- [Mahara \(EPortfolio\)](#)

◀ [Algebra 1](#)

[Geometry 1](#) ▶

Trigonometry 1

This topic covers:-

Angles and lines; symmetry and shape; right angles; sine and cosine rules; introduction to basic trigonometry

The CALMAT lessons for this topic are MoLS Level 1: Lessons 32, 33, 45, 46, 48

[CALMAT Notes and additional resources for Trigonometry 1](#)

Pythagoras' Theorem

MathCentre [Pythagoras' Theorem](http://www.mathcentre.ac.uk/students/topics/trigonometry/pythagoras/) <http://www.mathcentre.ac.uk/students/topics/trigonometry/pythagoras/>

- [Use Pythagoras to find the hypotenuse](#)
- [Use Pythagoras to find a side in a right angle triangle](#)

Solving Triangles

MathCentre [Trig Ratios](http://www.mathcentre.ac.uk/students/topics/trigonometry/trig-ratios/) <http://www.mathcentre.ac.uk/students/topics/trigonometry/trig-ratios/>

- [Find the third angle of a right angle triangle](#)
- [Find the third angle of a triangle 1](#)

Search forums

Latest news

[Add a new topic...](#)

25 Sep, 23:46

Sue Milne

[New Questions more...](#)

24 Sep, 18:15

Sue Milne

[October 1st and 8th - Self Study more...](#)

[Older topics ...](#)

My Courses

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Upcoming events

There are no upcoming events

[Go to calendar...](#)

[New event...](#)

Recent activity

Activity since Thursday, 25

October 2012, 6:55 PM

[Full report of recent activity...](#)

Nothing new since your last login

QTI in Moodle 2 - Question

Maths T1

My home / My courses / MathsT1 / Trigonometry 1 / Use Pythagoras to find a side in a right angle triangle

Use Pythagoras to find side in right triangle

In triangle ABC, angle B is 90° , the length of AC is 22 and the length of AB is 7.

Find the length of BC.

You may find it helpful to draw a diagram.

Give your answer correct to 2 decimal places.

Correct

Show Hint

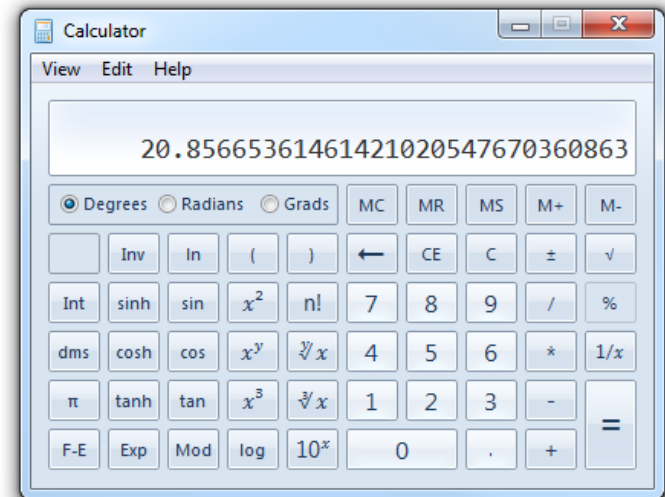
Show Solution

SUBMIT ANSWER

Reinitialise

Finish and review

Exit



QTI in Moodle 2 - Question with Solution

Maths T1

My home / My courses / MathsT1 / Trigonometry 1 / Find an angle in a scalene triangle, given the three sides

Find an angle in a scalene triangle, given the three sides

In triangle ABC, side $a=50\text{cm}$, side $b=36\text{cm}$ and side $c=38\text{cm}$. Find angle C in degrees.

Enter your answer to 2 decimal places.

C =

We apply the cosine rule

$$\begin{aligned}c^2 &= a^2 + b^2 - 2ab\cos(C) \\2ab\cos(C) &= a^2 + b^2 - c^2 \\ \cos(C) &= \frac{a^2 + b^2 - c^2}{2ab} \\ \cos(C) &= \frac{50^2 + 36^2 - 38^2}{2 \times 50 \times 36} \\ \cos(C) &= \frac{2500 + 1296 - 1444}{3600} \\ \cos(C) &= 0.653333 \\ C &= \cos^{-1}(0.653333) \\ C &= 84.97^\circ\end{aligned}$$

Reinitialise and play again

QTI in Moodle 2 - Maths Input

Maths T1

My home / My courses / MathsT1 / Differential Calculus / Differentiate ax^b expressed as a fraction

Differentiate ax^b , a integer, $b \neq 0$, as fraction

Differentiate

$$-\frac{6}{y^5}$$

✔ I have interpreted your input as:

$$\frac{30}{y^6}$$

Show Hint

Show Solution

SUBMIT ANSWER

Reinitialise

Finish and review

Exit

Test: Algebra 1

QT/ILT/ Test & demonstration course

My home / My courses / NB101 / Example Tests / Test - Algebra 1

- Expand $(ax+b)(cx+d)$ **Answered**
- Solve simultaneous equations **Not Answered**
- Solve a linear inequality with variable and constants on both sides **Answered**
- Factorise a quadratic, $a=1$ **Not Seen**
- Solve a linear equation involving brackets **Not Seen**
- Solve a linear equation with the variable on both sides **Not Answered**
- Evaluate $x(y-p(x-qz))$ **Not Seen**
- Factorise ax^2-by^2 **Not Seen**
- Solve a quadratic equation **Not Seen**
- Simplify a rational expression using the rules of indices **Not Seen**
- Use division rule, 2 variables, coeff in Z **Not Seen**
- Simplify the square root of a number **Not Seen**

This test is the one used in the Maths T1 topic Algebra 1. It is also in the demo course.

Question in a Test

My home / My courses / NB101 / Example Tests / Test - Algebra 1

Solve simultaneous equations

Answered

Use the substitution method to solve these simultaneous equations.

$$-x + y = -1 \quad \dots(1)$$

$$-4x - y = -19 \quad \dots(2)$$

The system of simultaneous equations shown above has

One solution (x, y)

No solutions

An infinite number of solutions

If the equations have a single solution, enter the values of x and y below. Otherwise leave these input boxes empty.

$(x, y) = (4$, 3)

You may attempt this question up to 3 times during the test.

SUBMIT ANSWER

Test Question Menu

The indicator at top right shows the question status. No feedback is visible during the test - students have been using these randomised questions in formative mode for several weeks. Candidates return to the list of questions to select another question.

Test feedback & review

My home / My courses / NB101 / Example Tests / Test - Algebra 1

Feedback

You have reached the end of the test.

Your question scores are as follows:

Question 1:	2.0
Question 2:	2.0
Question 3:	3.0
Question 4:	2.0
Question 5:	0.0
Question 6:	2.0
Question 7:	0.0
Question 8:	1.0
Question 9:	2.0
Question 10:	2.0
Question 11:	2.0
Question 12:	2.0
Question 13:	2.0
Question 14:	2.0
Question 15:	2.0
Question 16:	2.0

Your total score was 28.0 out of 33, which is 84.8%.

My home / My courses / NB101 / Example Tests / Test - Algebra 1

Review your responses

Expand $(ax+b)(cx+d)$ [Review](#)

Solve simultaneous equations [Review](#)

Solve a linear inequality with variable and constants on both sides [Review](#)

Factorise a quadratic, $a=1$ [Review](#)

Solve a linear equation involving brackets [Review](#)

Solve a linear equation with the variable on both sides [Review](#)

Evaluate $x(y-p(x-qz))$ [Review](#)

Factorise ax^2-by^2 [Review](#)

Solve a quadratic equation [Review](#)

Simplify a rational expression using the rules of indices [Review](#)

Use division rule, 2 variables, coeff in Z [Review](#)

Simplify the square root of a number [Review](#)

Speed: time given speed and distance [Review](#)

These are the two parts of the feedback and review page; the scores for the questions are displayed and the candidate may return to see the questions and their input.

Next Year?

- Facebook group
 - Class already has group for this year
 - Make more use of it
- Encourage use of social tools from start
- Find (more) quirky maths that fits students' interests
- Check that content still aligns with other modules
 - New topics
 - Split joined topics, e.g. "Stats" and "Vectors"
 - Revise content of current topics - more about vectors?