

Learning Activity 2 : Solving and Transposing Linear Equations with the CAS calculator. Using the CAS calculator to replace manual methods of algebraic manipulation.

Learning Behaviours: Watch attentively a demonstration, Follow written instructions, Check work, Request further information, Attempt and complete tasks correctly.

Teacher: RNP

DATE: 31/3/06

Class: 10 Maths Methods

Learning Activity Description

Students will use the CAS system to solve Linear Equations and Transform linear equations. (This is work we have been doing manually in class). Students are asked to check the reasonableness of their answers by substitution. After a demonstration of the ClassPad300 using the multimedia projector (hooked up to a computer running the ClassPad manager), students worked through a self paced set of examples and problems to familiarise themselves with using the CAS (Computer Algebra System) calculator to solve linear equations and to transpose linear equations.

Discussion Tool:

The activities took up the entire lesson and we did not have a discussion.

Teacher Journal:

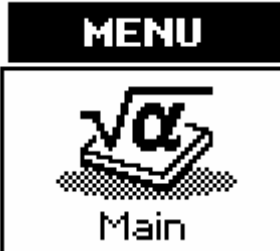
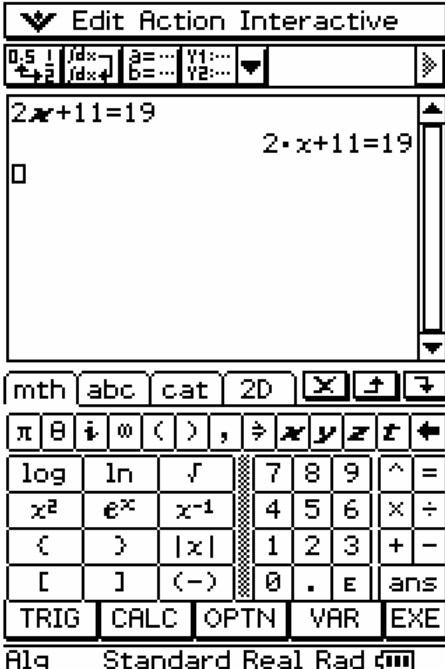
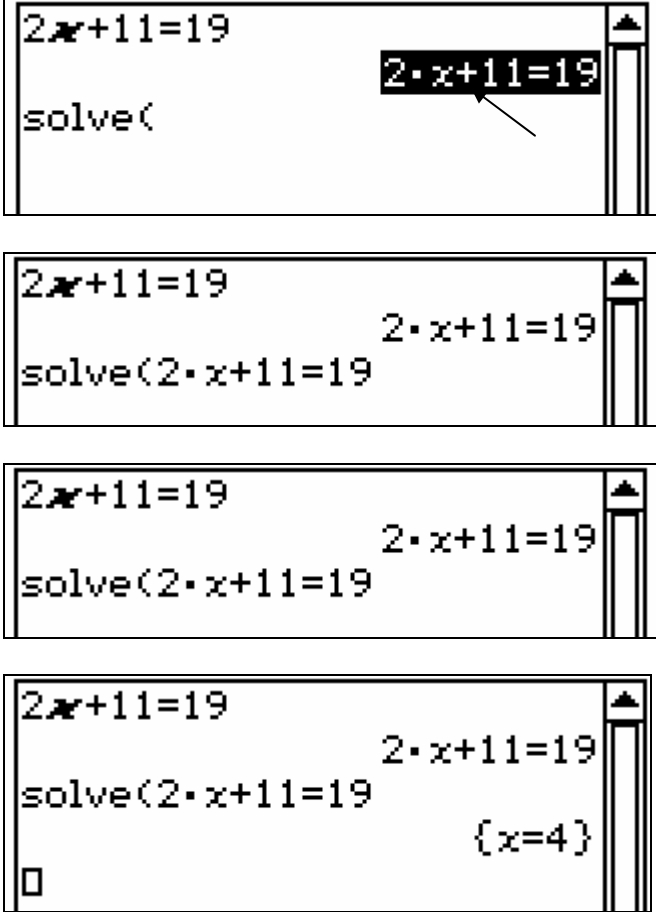
I supplied students with some worksheets. On one side there were diagrams and simple instructions which led the students through solving and transposing equations using the CAS calculator. On the other side of the handouts was a set of problems for the students to do using the CAS calculator and to check by substitution or by manually doing the problem by traditional methods.

This lesson went well, students gained confidence with the CAS calculator. Most students were able to use the CAS calculator to solve and transpose linear equations by the end of the lesson.

Next session students will use the CAS system as a tutor to consolidate their knowledge of solving linear equations by “doing the same thing to both sides”.

SOLVING EQUATIONS WITH THE CLASSPAD300

Example: Solve the following linear equation $2x + 11 = 19$

<p>Start up the Classpad, select the Main menu option and type in the equation $2x + 11 = 19$ using the soft keyboard....</p> <div style="text-align: center;">  <p>Main</p> </div>	
<p>Type the word solve(</p> <p>Highlight the equation $2x+11=19$ and drag it so that it sits beside the word solve(It should now appear as Solve(2x+11=19</p> <p>Click on EXE to complete the action</p> <p>The solution will appear in the braces Solution is {x=4}</p>	


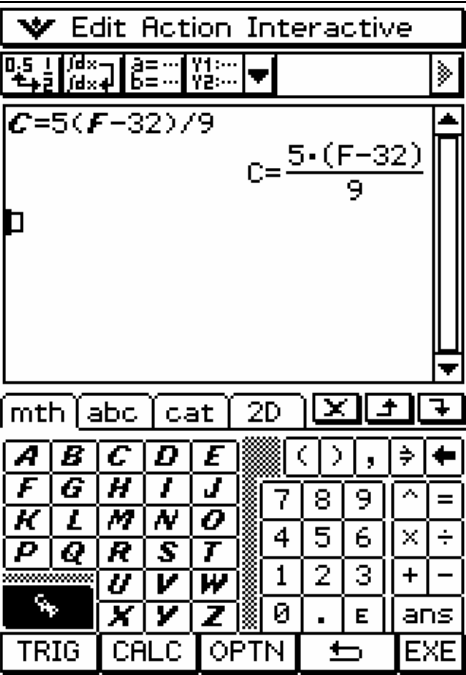
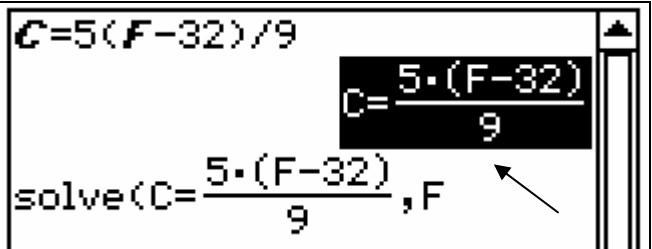
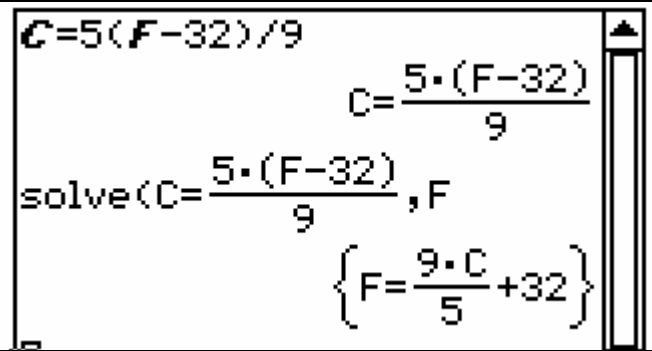
**SOLVE THE FOLLOWING LINEAR EQUATIONS
USING THE CLASSPAD 300**

Equation to solve	Solution	Check
$2x + 7 = 17$		
$\frac{x}{2} + 4 = 8$		
$4x + 5 = 2x + 13$		
$2(x + 3) = 10$		
$2(x - 7) = 6(x + 1)$		
$\frac{2x}{5} - 6 = -2$		
$\frac{x + 2}{4} = 3$		
$5x + 4 = x - 8$		

Check the answers to three of the above problems by SUBSTITUTION or by doing the problem with pen and paper.

TRANSFORMING WITH THE CLASSPAD300

Example: Transform the equation $C = \frac{5(F-32)}{9}$ to make F the subject

<p>Start up the Classpad, select the Main menu option</p>  <p>and type in the equation</p> $C = \frac{5(F-32)}{9}$ <p>using the soft keyboard....</p>	
<p>Type the word solve(</p> <p>Highlight the equation</p> $C = \frac{5(F-32)}{9}$ <p>and drag it so that it sits beside the word solve(</p> <p>It should now appear as</p> $\text{Solve}(C = \frac{5(F-32)}{9})$ <p>Type a comma and then F (remember we want F to be the subject)</p> <p>Click on EXE to complete the action</p>	  <p>The solution will appear in the braces</p> <p>Solution is $F = \frac{9C}{5} + 32$</p>

**TRANSFORM THE FOLLOWING EQUATIONS
USING THE CLASSPAD 300**

Equation to solve	Solution
$A = B + C$ (Find • C)	
$P = \frac{k}{V}$ (Find • k)	
$x^2 + y^2 = 9$ (Find • x)	
$F = \frac{2A(B - C)}{D}$ (Find • A)	
$V = u + at$ (Find • u)	
$A = \pi R^2$ (Find • R)	
$I = \frac{PRT}{100}$ (Find • P)	
$S = ut + \frac{at^2}{2}$ (Find • u)	

Check the answers to three of the above problems by doing the problem with pen and paper.