






## **MTEST USER MANUAL version 1.07**

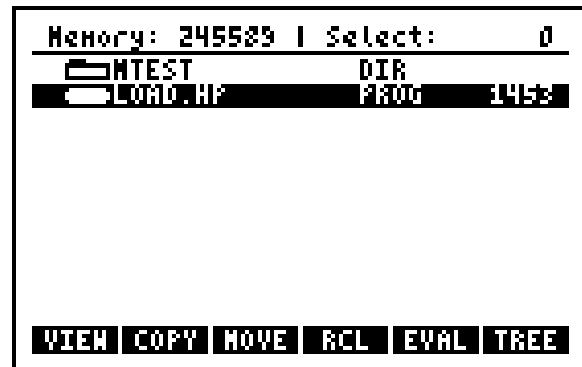
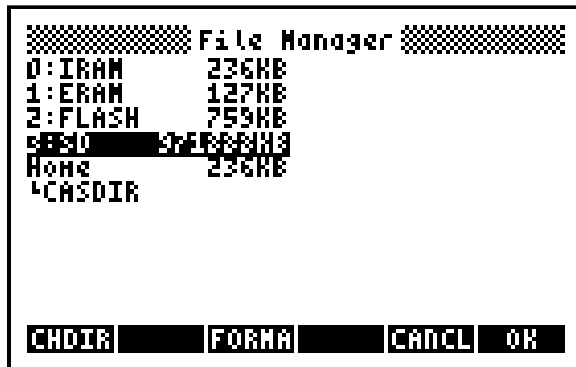
MTEST is a computer aided assessment (CAA) software package for the HP50g calculator for secondary (high) school mathematics students and teachers.

Version 1.07 contains the following programs:

<b>TOPIC</b>	<b>TOPIC ABBREVIATION</b>	<b>PROGRAM</b>
ALGEBRA	ALGEB	ALGEBRA 1  ALGEBRA 2
FINANCIAL	FINAN	PERCENTAGES 1
GEOMETRY	GEOME	PYTHAGORAS' THEOREM 1
NUMBER	NUMBE	DIVISION TABLES  POWERS  TIMES TABLES
RELATIONS	RELAT	LINEAR RELATIONS 1  LINEAR RELATIONS 2
VCAA EXAMINATIONS	VCAAE	MM3&4 2006 EXAM 1 0

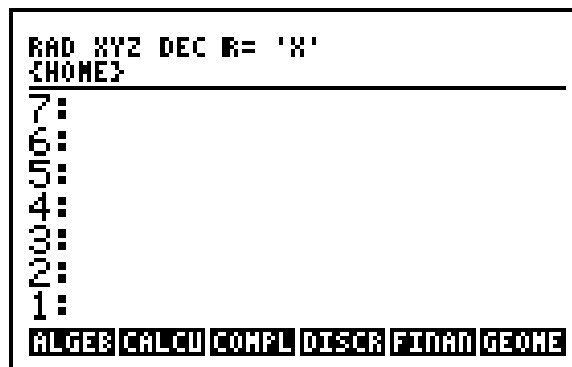
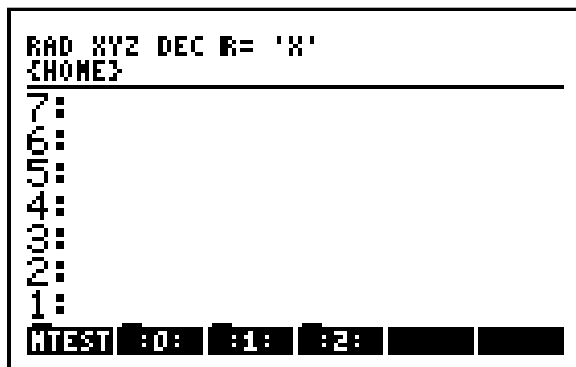
## Installing MTEST

1. Download the latest version from [www.southerncrossmicro.com](http://www.southerncrossmicro.com)
2. Unzip the "MTESTv1.07SD" folder. Open the "SD" folder and copy the two files "MTEST" and "LOADMTEST" to a 1GB or 2GB SD card
3. Insert the SD card into the calculator, open port 3 by pressing , , ,  ("OK"), highlight "LOADMT~1.HP" and press  ("EVAL")

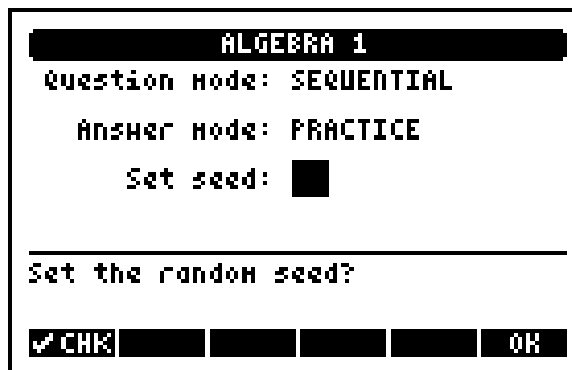


## Using MTEST in PRACTICE mode - "ALGEBRA 1" program

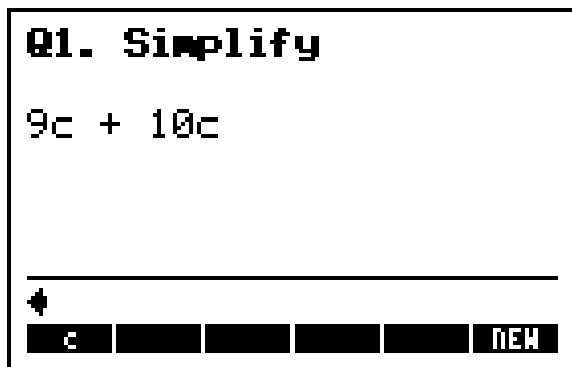
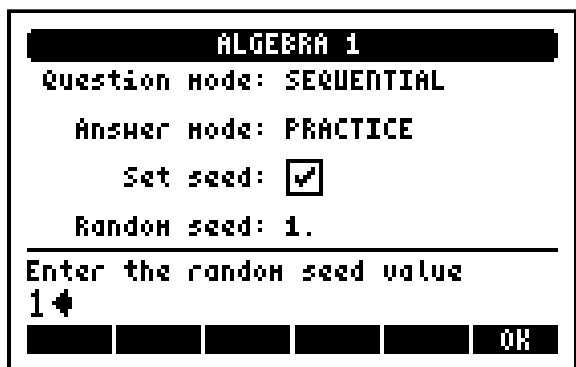
Open MTEST by pressing  $\rightarrow$ ,  $\boxed{2}$ ,  $\boxed{F1}$ .



Select the "ALGEBRA" topic by pressing  $\boxed{F1}$ ,  $\boxed{F6}$  ("OK").



Press  $\boxed{F1}$  and then  $\boxed{I}$ , followed by  $\boxed{ENTER}$ ,  $\boxed{F6}$  ("OK").



Enter the answer, "19c", then press **ENTER**. A tick is displayed at the right to show that the result entered is correct.

**Q1. Simplify**  
 $9c + 10c$   
  
19c ✓

c

NEW

Press **F5** ("NEW") to generate another question of the same type, and suppose now an incorrect response, say "15", is entered. A cross is displayed at the right.

**Q1. Simplify**  
 $12c + 3c$

c

NEW

**Q1. Simplify**  
 $12c + 3c$   
  
15 ✗

c

NEW

Press **▽** to go to the next question. The program can be halted when in PRACTICE mode so that calculations can be performed on the stack by pressing **←**, **4**.

**Q2. Simplify**  
 $-11w + w$

w

NEW

RAD XYZ DEC R= 'X' HLT  
{HOME}  
7:  
6:  
5:  
4:  
3:  
2:  
1:  
ALGEB CALCU COMPL DISCR FINAN GEOME

Perform any calculations required on the stack and resume program execution by pressing  $\leftarrow$ ,  $\text{ON}$ , then enter the answer. Press  $\triangle$  to return to the previous question.

**Q2. Simplify**

$-11w + w$

$-10w$  ✓

---

✦

**H** **FINAN** **NEW**

**Q1. Simplify**

$12c + 3c$

$15$  ✕

---

✦

**c** **FINAN** **NEW**

Press  $\text{ON}$  to exit the program.

The path of the most recent program accessed in the MTEST library is saved in the HOME directory of the HP50g under the name "PROGR". Press  $\text{FI}$  ("PROGR") to run the program again.

RAD XYZ DEC R= 'X'

CHOME?

---

7:  
6:  
5:  
4:  
3:  
2:  
1:

**PROGR** **CASDI** **OK**

**ALGEBRA 1**

Question Mode: SEQUENTIAL

Answer Mode: PRACTICE

Set seed: ☐

---

Set the random seed?

☒ **CHK** **OK**

Press  $\triangle$  twice and then press  $\text{F2}$  ("RAN"). In this mode question types appear in a random order rather than in a known sequence. Press  $\text{F6}$  ("OK").

**ALGEBRA 1**

Question Mode: **RANDOM**

Answer Mode: PRACTICE

Set seed: ☐

---

SEQUENTIAL or RANDOM Mode?

**SEQ** **RAN** **OK**

**Q1. Simplify**

$12c + 7c$

---

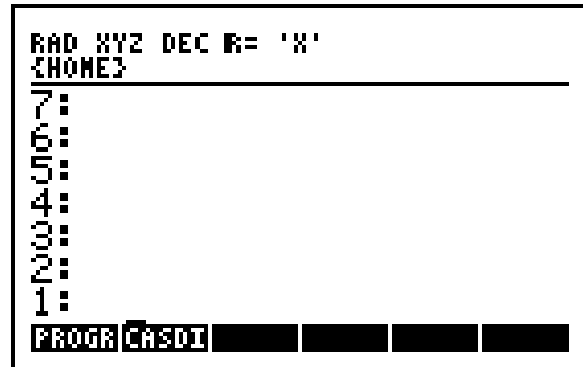
✦

**c** **NEW**

Enter the correct answer, "19c", and press **ENTER**. Then press **▼** to go to the next question.

The calculator can be turned off without exiting the program by pressing **→**, **ON**. Press **ON** to turn the calculator back on and resume program execution.

Exit the program by pressing **ON**.



### Using MTEST in EXAM mode - "ALGEBRA 1" program

From the HOME screen press  $\text{F1}$  ("PROGR"), then press  $\Delta$ ,  $\text{F2}$  ("EXAM") to select EXAM mode and press  $\text{F6}$  ("OK").

<b>ALGEBRA 1</b>					
Question Mode: SEQUENTIAL					
Answer Mode: <b>EXAM</b>					
Set seed: <input type="checkbox"/>					
PRACTICE or EXAM Mode?					
<b>PRAC</b>	<b>EXAM</b>				<b>OK</b>

<b>Q1. Simplify</b>					
$-2w + 3w$					
<hr/>					
⬆					
<b>w</b>					

(note: the question type and/or the values displayed on your screen will be different to those above because the system clock is used to seed the random number generator when in EXAM mode)

Enter the correct answer, "w", and press  $\text{ENTER}$ . The next question is automatically displayed.

<b>Q2. Simplify</b>					
$10c + 5c$					
<hr/>					
⬆					
<b>c</b>					

Enter the correct answer, "15c", and press  $\text{ENTER}$ . The next question is automatically displayed.

Now enter an incorrect response, say "5rs", then press  $\text{ENTER}$ .

<b>Q3. Simplify</b>					
$-5r \times s$					
<hr/>					
⬆					
<b>r</b>	<b>s</b>				

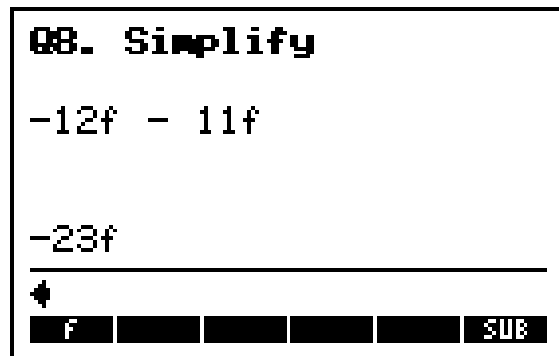
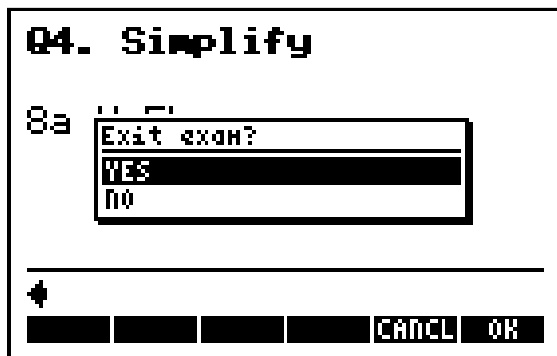
<b>Q4. Simplify</b>					
$8a \times 5b$					
<hr/>					
⬆					
<b>a</b>	<b>b</b>				

To see how much time has elapsed since commencing the exam, press  $\rightarrow$ ,  $\boxed{9}$ .

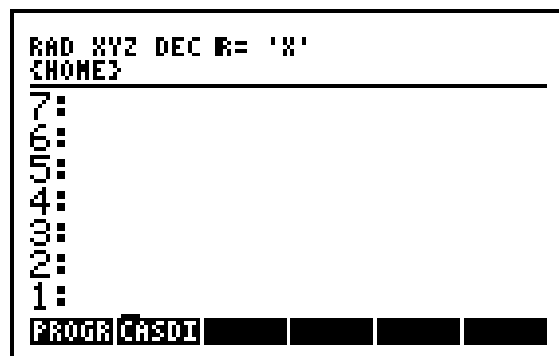
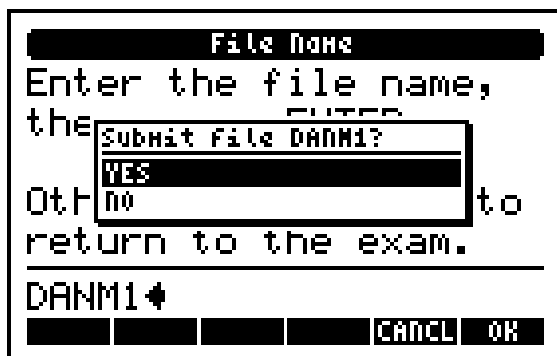


Press  $\boxed{F6}$  ("OK"), then press  $\boxed{ON}$  to exit the exam. A warning is displayed- press  $\boxed{F5}$  ("CANCL") and continue entering responses.

"SUB" (submit) appears when the last question has been reached. Enter a response and then press  $\boxed{F6}$  ("SUB").



Enter the file name (press  $\boxed{ALPHA}$  to unlock the alpha-lock setting if you wish to enter any numbers in the file name) and press  $\boxed{ENTER}$ , followed by  $\boxed{F6}$  ("OK").





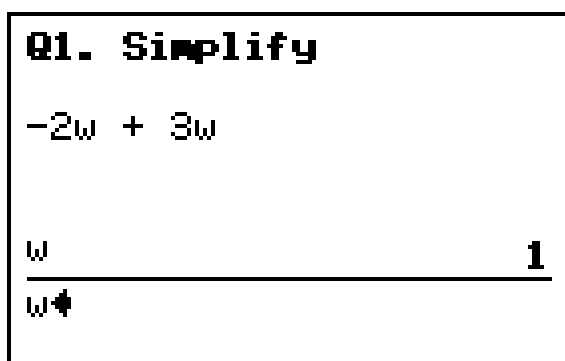
Open the MTEST library again and press **NXT** , then press **F6** ("FILE"), followed by **F6** ("OK") to select the ALGEBRA topic. Press **F6** ("OK") again to select the "ALGEBRA 1" test.




The file name is displayed, together with the score ("7/8") and the time taken, in minutes, to complete the test ("12.6").

Press **F6** ("OK") to view the results. The response entered by the user appears above the line, whilst the correct answer is displayed below the line.

The score ("0" for an incorrect response and "1" for a correct response) appears at the right of the screen.






Press  to view the results for the next question.

**Q2. Simplify**

$$10c + 5c$$

$$\frac{15c}{15c} \quad \mathbf{1}$$

Press  to view the results for the remaining questions and  to return to any previous questions. As can be seen, all questions except Q3 were answered correctly. Press  to exit viewing the results.

**Q3. Simplify**

$$-5r \times s$$

$$\frac{5rs}{-5rs} \quad \mathbf{0}$$

**Q4. Simplify**

$$8a \times 5b$$

$$\frac{40ab}{40ab} \quad \mathbf{1}$$

**Q5. Simplify**

$$4q - 4q$$

$$\frac{0}{0} \quad \mathbf{1}$$

**Q6. Simplify**

$$8m \times -3n$$

$$\frac{-24mn}{-24mn} \quad \mathbf{1}$$

**Q7. Simplify**

$$-4y \times -2z$$

$$\frac{8yz}{8yz} \quad \mathbf{1}$$

**Q8. Simplify**

$$-12f - 11f$$

$$\frac{-23f}{-23f} \quad \mathbf{1}$$

### ***“LINEAR RELATIONS 1” program***

Like the “ALGEBRA 1” program, the “LINEAR RELATIONS 1” program can be used in both “PRACTICE” and “EXAM” modes.

The “LINEAR RELATIONS 1” program however contains an extra screen to display graphs of linear relations.

Open MTEST and select the “RELATIONS” folder (“RELAT”).

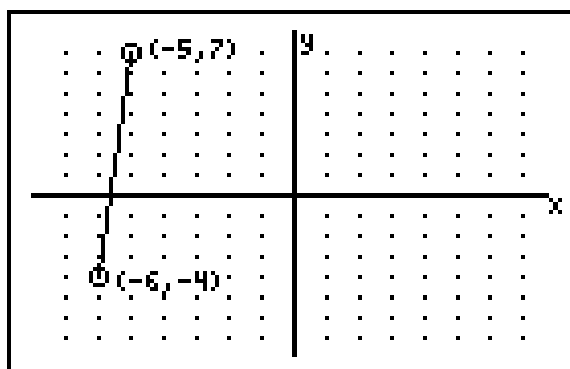
Press “OK” to select the “LINEAR RELATIONS 1” program, ensure “PRACTICE” mode is selected and then set the random seed value to 1. Then press “OK” to run the program (see *Using MTEST in PRACTICE mode - “ALGEBRA 1” program* on how to do this).

The first question is displayed. Press **NXT** to see the graph of the line in question. Press **NXT** again to return to the question screen.

**Q1. Find the gradient of the line**

\_\_\_\_\_

UNDEF NEW



Enter the correct answer, “11”, and press **ENTER**.

**Q1. Find the gradient of the line**

11 ✓

UNDEF NEW

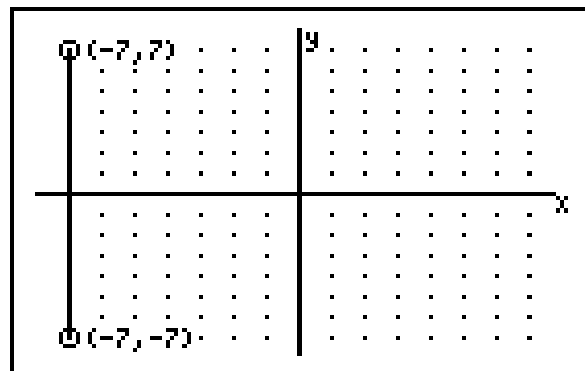
Questions 2 to 5 are answered in a similar way.

Now look at question 6.

**Q6.** Find the **gradient**  
of the line

---

UNDEF      NEW



As the line is vertical the gradient is undefined, so press  , .

**Q6.** Find the **gradient**  
of the line

UNDEFINED ✓

---

⬆

UNDEF      NEW

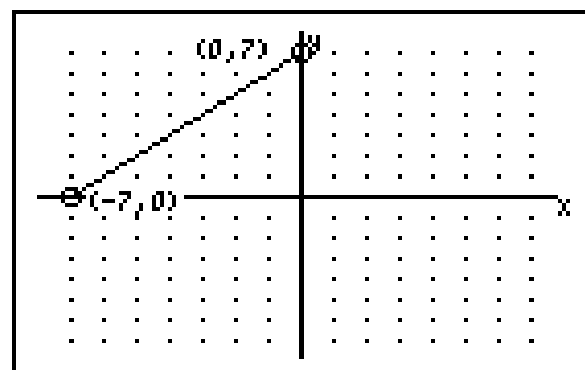
Press  to go to question 7.

**Q7.** Find the **equation**  
of the line

---

⬆

y=  x=     NEW



As can be seen from the graph, the equation of the line is  $y = x + 7$ . Press  $\boxed{F1}$ ,  $\boxed{X}$ ,  $\boxed{+}$ ,  $\boxed{7}$ ,  $\boxed{ENTER}$ .

**Q7. Find the equation of the line**

$y=x+7$  ✓

---

✚

$y=$ 
 $x=$ 



**NEW**

Questions 8 to 12 are answered in a similar way.

Now look at question 13.

**Q13. Draw the graph of the line with equation  $y=2x+4$**

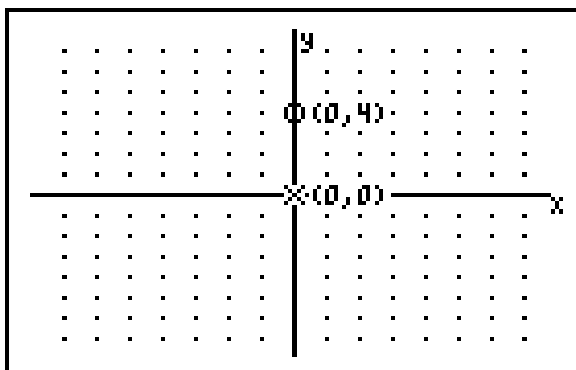
  







Line not drawn

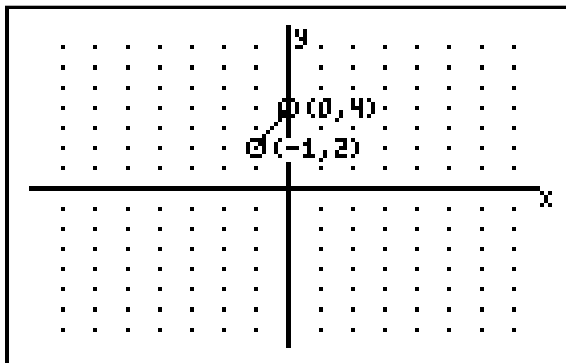
---

**NEW**

Press  $\boxed{NXT}$  and use the  $\boxed{\leftarrow}$   $\boxed{\rightarrow}$   $\boxed{\triangleup}$   $\boxed{\triangledown}$  keys to move the "X" to a point on the given line. In this example the "X" is moved to the y-intercept at (0,4). Then press  $\boxed{ENTER}$ .



Use the     keys again to move the "X" to another point on the line. Here it is moved to (-1,2). Then press . The results are submitted. Now press . The equation of the line drawn is displayed and it is of course as required.





**Q13.** Draw the **graph** of the line with equation  $y=2x+4$

$y=2x+4$



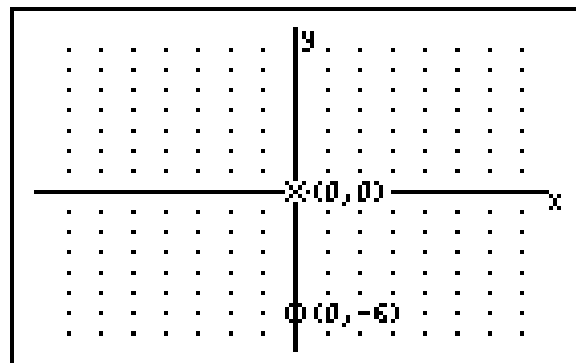
      **NEW**



Press  to go to question 14. As before, move the "X" to the y-intercept at (0,-6) and press .

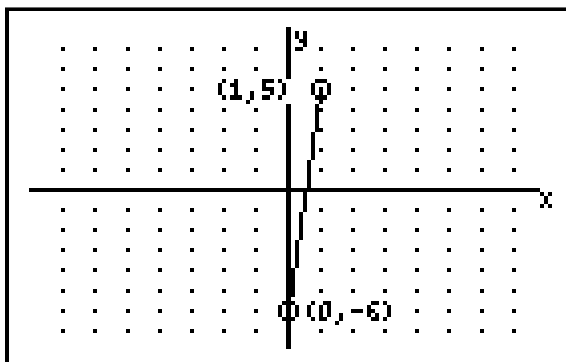
**Q14.** Draw the **graph** of the line with equation  $y=-11x-6$

Line not drawn

      **NEW**



Suppose an error is now made and the "X" is moved to (1,5). Press , . The equation of the line drawn is displayed and as can be seen it is not what was required.



**Q14.** Draw the **graph** of the line with equation  $y=-11x-6$

$y=11x-6$



      **NEW**

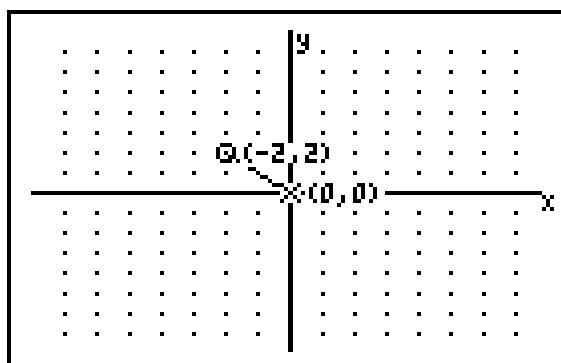
Press  $\nabla$  to go to question 15. This time the y-intercept is off the screen and so another point must be chosen. Choose  $(-2, 2)$ .

**Q15.** Draw the **graph** of the line with equation  $y=8x+18$

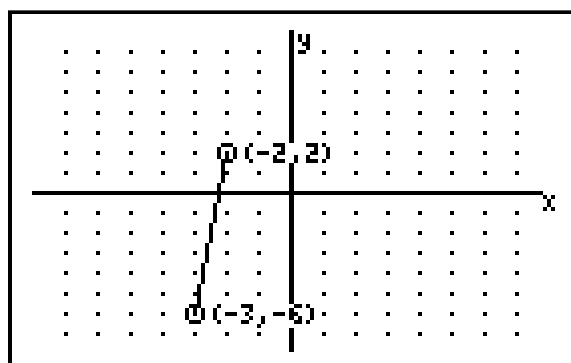
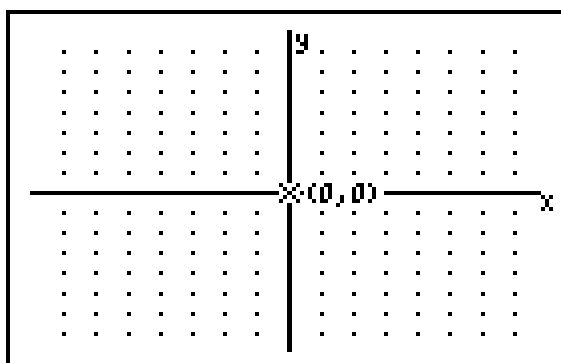
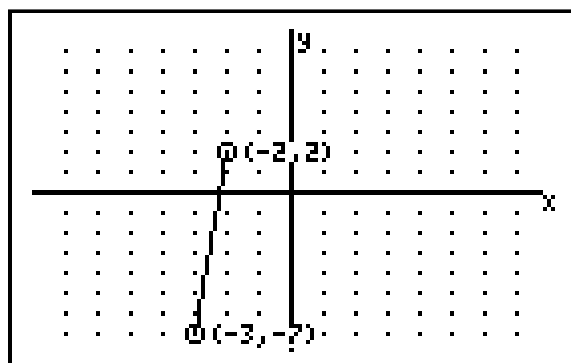
Line not drawn

---

NEW



The other point must now be located at  $(-3, -6)$ . However suppose an error is made and  $(-3, -7)$  is entered as the second point. Press  $\rightarrow$   $\leftarrow$  to reset the screen and enter the correct points. Then press  $\text{NXT}$ .



**Q15.** Draw the **graph** of the line with equation  $y=8x+18$

$y=8x+18$  ✓

---

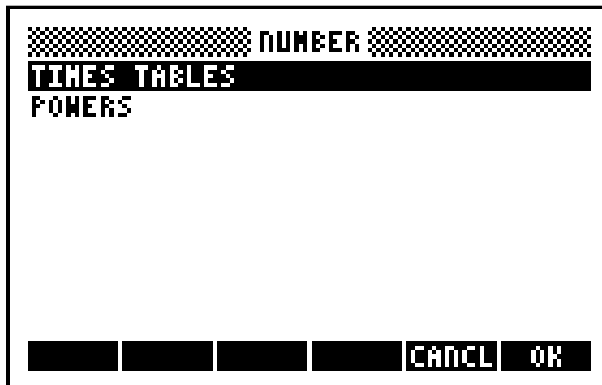
NEW

Questions 16, 17 and 18 are answered in a similar way.

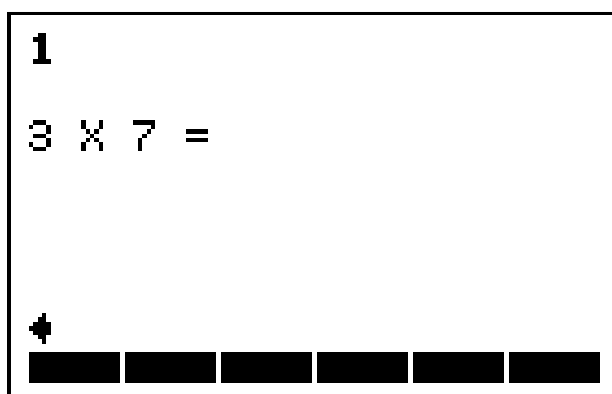
A "LINEAR RELATIONS 1" file is accessed and viewed the same way as an "ALGEBRA 1" file. The only difference is that the "LINEAR RELATIONS 1" file will contain an extra screen, which can be viewed by pressing  $\text{NXT}$ .

### ***"TIMES TABLES" program***

Open the MTEST library, press **(NXT)**, **(F2)** ("NUMBE") then **(F6)** ("OK"). Enter the file name.



Once **(ENTER)** is pressed, the timer is started and the first question is displayed.



*(note: the values displayed on your screen will be different to those above because the system clock is used to seed the random number generator for the "TIMES TABLES" program)*



Enter a response and press **ENTER**. The next question is automatically displayed if the response entered is correct.

**1**

3 X 7 =

21

**2**

12 X 12 =

If an incorrect response is entered the next question will not be displayed (press **ON** to exit the program at any time).

**2**

12 X 12 =

132

When all questions (121 in total – the 1's times tables are not included) have been answered correctly the time taken is displayed and saved.

**TIMES TABLES results**

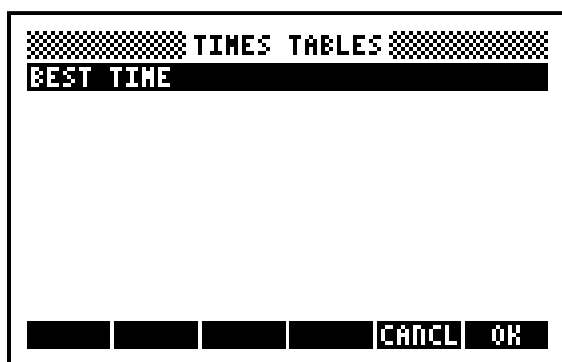
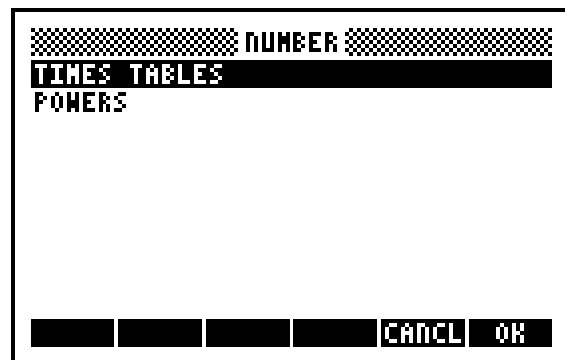
**Name: DAN**

**Time (seconds): 152.523681..**

**OK**

Press **F6** ("OK") to exit.

To see the best time , open the MTEST library and press **NXT** , then press **F6** ("FILE"), followed by seven presses of the **▼** key to highlight the NUMBER topic. Press **F6** ("OK") three times to view the best time.



Execution of the remaining programs in the MTEST library will be similar to that for the programs above.