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It is my hope that you find the file of use to you personally – I know that I would have liked to have found some of these files years ago – they would have saved me a lot of time !

Colin Hinson

In the village of Blunham, Bedfordshire.



# TEXAS INSTRUMENTS HOME COMPUTER

MILLIKEN MATH SEQUENCES:

## DECIMALS

EDUCATION

### SOLID STATE CARTRIDGE

A self-paced "tutor" which presents a variety of math problems involving decimal numbers. Suitable for children from grades 5 through 8.

*Changing fractions to decimals*

$2.145 \times 10 = ?$

$3 \overline{) 10} = 3$

$\frac{17}{100} = ?$

**Milliken**

**Decimals**

*Sum*  
*Addend*  
*Addend*

$52 \overline{) 234.28}$

*Quotient*  
*Divisor*  
*Dividend*

$.009$

$3447 \times 3 = ?$

*finding the number of decimals*

$8$

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# Quick Reference Guide

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Note that the key sequences required to access special functions depend on the type of computer console you have. Important keystroke sequences are summarized here for your quick reference.

<i>TI-99/4</i> <b>ENTER</b>	<i>TI-99/4A</i> <b>ENTER</b>	Proceeds to next problem or continues problem after an incorrect answer has been given. Proceeds to the next step of a problem in the "Let Me Help You" feature. Also used to enter Beginning Level and Name.
<b>Period Key (.)</b>	<b>Period Key (.)</b>	Used to enter a decimal point (.).
<b>SPACE BAR</b>	<b>SPACE BAR</b>	Selects greater than (>), less than (<), or equals (=) when these symbols alternately flash on the screen in Levels 2-5 and 7-8.
		Selects the regrouping option in Levels 13-20, 22, 24-26, 28-30, and 41-49.
		Selects the correct place to begin entering an answer in a division problem (Levels 50-56).
		Selects short division instead of long division (Levels 50-56).
<b>ARROW KEYS</b> (←S) (→D)	<b>ARROW KEYS</b> (←S) (→D)	Used to place the decimal point in the product (multiplication problems, Levels 41-49).
<b>BACK ARROW</b> (←S)	<b>BACK ARROW</b> (←S)	Used to erase answer and start over in a division problem (Levels 41-49).
<b>E</b>	<b>E</b>	Tells the computer you want to quit ("exit") the work session or leave a particular level.
<b>SHIFT Q</b> (QUIT)	<b>FCTN =</b> (QUIT)	Returns to the master title screen.

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# ***Milliken Math Sequences: Decimals***

This Solid State Cartridge is designed to be used with the Texas Instruments Home Computer. One in a series of twelve cartridges, it can help your child develop the strong math skills needed in today's and tomorrow's world. Suitable for children from grades five through eight.

Programmed by: John Plaster

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Program and data base contents

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See important warranty information at back of book.

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## A NOTE TO PARENTS

Children need strong math skills to solve today's and tomorrow's problems. The Milliken Math Sequences, along with the TI Home Computer, can help your child meet these challenges. The series allows children to work at their own pace and on the skill level at which they need practice. Children find that learning with the computer is fun, challenging, and motivating. The computer never tires of repetition or loses patience—it's like having a private math tutor!

The Milliken Math Sequences, developed for Texas Instruments by Milliken Publishing Company, consists of twelve Solid State Cartridges. Each cartridge concentrates on a different skill area in mathematics, such as addition, subtraction, decimals, or fractions. By providing different levels of difficulty, the series is suitable for children from the kindergarten age through grade eight.

The Decimals cartridge is divided into 56 levels of difficulty, covering material generally taught in grades five through eight. The program provides practice in recognizing decimals as fractions, determining the order of decimals, rounding decimals, and doing arithmetic with decimals. Children add, subtract, multiply, and divide while developing the special skills involved in working with decimal numbers. This program assumes that your child has mastered basic arithmetic and a certain degree of mental computation.

The Decimals cartridge offers several special features that increase its motivational and reinforcement value:

- Colorful, rewarding graphics and sound effects that appear in response to correct answers.
- An unthreatening, try-again approach to incorrect answers.
- A progress report posted at the bottom of the screen.
- Periodic reviews to maintain skill mastery.
- A “help” feature that displays the problem step by step until the final answer is found.
- Advancement to the next level if problems are answered correctly, or automatic return to a lower level if your child needs more practice.
- A special regrouping feature to help students understand the concept of carrying and borrowing from one column to another.
- Special practice for finding the correct place to begin the answer in division problems.
- An option for either long or short division at appropriate levels.
- An optional “erase” function provided at appropriate levels (division problems).
- Report screens personalized with your child’s name at the end of each level’s activities.
- An “Exit” screen with a complete report on your child’s score at the end of the work session.

## A SAMPLE ACTIVITY

For easy use, directions are displayed on the screen throughout all the levels. This sample activity, however, can help to illustrate the way the program works.

### Let's Begin

When the Milliken title screen appears, press any key to begin. The screen then prompts you to enter the Beginning Level. Select any level from 1 to 56 by typing the number and then pressing **ENTER**. For this example, press **2** and **ENTER**. Next, the screen asks for Name. Type your child's name (up to ten letters long) and press **ENTER**.

The directions on the screen tell you to "Press **SPACE BAR** when true." Your child must decide which number is greater than the other or if they are equal.

A progress report appears across the bottom of the screen, with the following meanings:

PL = Problem Level  
TC = Total Correct  
TP = Total Problems  
AVG = Average

As your child works through the problems, these figures are updated to report his or her progress. TC, TP, and AVG are automatically reset to zero at the beginning of each level.

### How the Computer Responds

Let your child answer a few problems as you observe. He or she simply presses the **SPACE BAR** when the correct symbol is displayed—greater than (**>**), less than (**<**), or equals (**=**). If the problem is answered correctly, an animated picture appears. Your child then presses **ENTER** to continue to the next problem.

If the problem is answered incorrectly, the screen border turns red and flashes. To continue, your child presses **ENTER** again, and the computer gives the answer, with a message to "Study the Answer." When your child presses **ENTER** again, the next problem appears.

Only one chance is given to answer correctly problems or questions that have only two or three possible answers (such as  $>$ ,  $<$ , and  $=$ ). At least two chances are given to answer correctly problems with many possible answers. In more complex problems which involve several steps, your child is given more chances to answer correctly.

### **Advancing or Moving Back**

If your child answers five of the previous six problems correctly, a "Good News" report is displayed. He or she then advances to the next level. If three problems in a row are answered incorrectly, a "Bad News" report appears, and your child moves back one level.

### **Changing Levels**

You can change levels any time the question mark is flashing. To leave this level, simply press the letter **E** for "exit." An "Exit" screen appears, which reports on your child's progress. Press **ENTER** to return to the title screen.

Let's try another level. Press any key to go to the "Levels 1-56" screen. This time, enter **6** as the Beginning Level. Then type your child's name again, and press **ENTER** to continue.

Now a problem is displayed on the screen. A flashing question mark shows where the answer will go, and the directions on the screen tell you to "Enter the correct decimal." Your child simply presses the correct number from the top row of keys, using the Period Key (.) for the decimal point.



## Entering Answers with Decimal Points

The decimal point is entered with the Period Key (.). The decimal point must be put in the correct place as the answer is entered at all levels except Levels 41-49 (multiplication problems). If the answer is less than one, a "0" is not entered before the decimal point.

## "Let Me Help You"

Now let's try the "Let Me Help You" feature. On the next problem, deliberately enter a wrong answer twice. When the border flashes red, press **ENTER** and the message "Let Me Help You" is displayed. Keep pressing **ENTER** and the computer completes the problem, step by step, until the final answer is found. Thus, if your child has difficulty with a particular problem, the computer demonstrates the solution.

Continue to observe as your child works through the problems and gains familiarity with the program's operations.

## DOING ARITHMETIC WITH DECIMALS

If the answer to be entered in a vertical addition, subtraction, or multiplication problem (Levels 12-20, 21-30, or 41-49, respectively) is more than one digit, the right-most digit must be entered first, as indicated by the flashing question mark. In other words, problems must be solved from right to left, just as they would be in the traditional pencil-and-paper method.

Also, remember to enter the decimal point in the correct place as you enter the answer (all arithmetic problems except in Levels 41-49, explained below). These methods reinforce the correct order of problem solution.

**Addition (Levels 12-20)**

In the addition problems your child is given the choice of regrouping (carrying) visually on the screen or of regrouping mentally without displaying the process. To use the regrouping option, press the **SPACE BAR** when instructed on the screen. A small question mark appears above the column to which the value is being carried or regrouped. Type the number to be carried, add the digits in that column, and type the sum. The regrouping option is offered whenever appropriate in Levels 13 through 20 (no regrouping necessary in Level 12).

**Subtraction (Levels 21-30)**

In the subtraction problems the regrouping (borrowing) option is offered as it was with addition. To use the option, press the **SPACE BAR** as before. A small question mark appears above the column from which the value is being borrowed or taken. Type the new value for that digit. Then a small question mark appears beside the column to which the value is being regrouped. Type this number (it must be a "1"), subtract the digits in that column, and type the answer. Finish the problem using the new value for the digit from which it was "borrowed."

If a problem has regrouping more than once, you must press the **SPACE BAR** the first time the option is offered on the screen if you want to use the option. The regrouping option is offered whenever appropriate at Levels 22, 24 through 26, and 28 through 30 (no regrouping at Levels 21, 23, and 27).

**Multiplication (Levels 31-35 and 40-49)**

The regrouping option is again offered in Levels 41-49. The procedure is the same as with addition.

When entering the product (answer) to problems in Levels 41-49, do not enter the decimal point until you have entered all the digits. Then, following the directions on the screen, use the **ARROW** keys, **-S** or **-D**, to place the decimal correctly. Then press **ENTER** when finished. Thus, the decimal point is added last, just as it normally would be in the traditional paper-and-pencil method.

### **Division (Levels 36-39 and 50-56)**

*Finding the Correct Place*—Beginning at Level 50, a small, moving question mark appears at the top of the problem. Your child must decide at what place to begin entering the quotient (answer). Press the **SPACE BAR** when the “?” is in the right place.

*Moving the Decimal Point*—Beginning at Level 51, the screen directions say to “Enter the number of places the decimal should be moved.” The decimal should be moved so that the divisor is a whole number. When your child types the number and presses **ENTER**, the decimal points in the divisor and dividend are moved automatically. When entering the quotient, simply put the decimal point at the same place as it is in the dividend.

*Entering Numbers*—In problems using the  $\overline{) \quad}$  format, quotients are entered from left to right, long division computation values are entered right to left, and remainders are entered left to right. Again, problems are solved just as they would be in the traditional pencil-and-paper method.

*Long Division or Short Division*—After typing the first digit of the quotient, the directions “Press **SPACE BAR** for short division” appear. Short division is offered because your child may wish to do the computation mentally. To use the short division option, press the **SPACE BAR** when instructed on the screen and enter the quotient. The short division option is offered whenever appropriate in Levels 50 through 56.

To use long division, do not press the **SPACE BAR**, but simply do the computation on the screen. Watch the flashing “?” and enter the appropriate numbers.

*Erasing with the Back Arrow*—At the same time the short division option is offered, the directions “Press **BACK ARROW** to try a new number” also appear. If your child finds that he or she has typed an incorrect digit in the quotient, the **BACK ARROW (S key)** can be used to erase and start over. This option can be used no more than twice in one particular problem.

**SKILL LEVELS**

This chart can help you find the appropriate starting level for your child. By looking at the sample problems and the skill description, select a level that is not too easy, but also not too difficult, for him or her. If in doubt, start at a lower level and work up from there. You may wish to select a REVIEW level first to see if your child has mastered the skill levels up to that point. A glossary is provided on pages 17-18.

<b>Level</b>	<b>Sample Problem</b>	<b>Skill Description</b>
1	$3 / 10 = ?$ $23 / 10 = ?$	Changing fractions to decimals. Numerators from 1 through 50; denominator is 10.
2	$.4 > .2$ $1.3 < 2.5$	Determining order of two decimal values; tenths up to 9.9.
6	$17 / 100 = ?$ $234 / 100 = ?$	Changing fractions to decimals. Numerators from 1 through 50; denominator is 100.
4—5	$7.95 > 4.90$ $.11 < 7.44$	Determining order of two decimals from .01 through 9.99.
6	$7 / 1000 = ?$ $2146 / 1000 = ?$	Changing fractions to decimals. Numerators from 1 through 5000; denominator is 1000.
7	$2.014 < 2.463$	Determining order of decimals with thousandths; values from .001 through 9.999.

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Level	Sample Problem	Skill Description
8	$5.580 > .511$	REVIEW: Determining order of decimals with tenths, hundredths, & thousandths; values from .1 through 9.999.
9	$44.8 = ?$ $58.513 = ?$	Rounding to the nearest integer; numbers from 1.5 through 99.999.
10	$23.78 = ?$ $49.38 = ?$	Rounding to the nearest tenth; numbers from .09 through 99.999.
11	$.278 = ?$ $3.046 = ?$	Rounding to the nearest hundredth; numbers from .009 through 99.999.
12	$\begin{array}{r} .2 \\ + .4 \\ \hline ? \end{array}$	Adding tenths; addends from .1 through .9.
13	$\begin{array}{r} 1.2 \\ + 2.7 \\ \hline ? \end{array}$	Adding integers and tenths; addends from 1 through 9.9. Two and three addends; some regrouping.
14	$\begin{array}{r} 3.4 \\ 2.6 \\ + 1.7 \\ \hline ? \end{array}$	
15	$\begin{array}{r} .12 \\ + .38 \\ \hline ? \end{array}$	Adding hundredths; addends from .01 through .99. Some regrouping.

Level	Sample Problem	Skill Description
16	$\begin{array}{r} 1.54 \\ + 3.08 \\ \hline ? \end{array}$	REVIEW: adding integers, tenths, and hundredths; addends from .01 through 9.999. Two and three addends; some regrouping.
17	$\begin{array}{r} .69 \\ 5.00 \\ + 2.80 \\ \hline ? \end{array}$	
18	$\begin{array}{r} .125 \\ + .047 \\ \hline ? \end{array}$	Adding thousandths; addends from .001 through .999. Some regrouping.
19	$\begin{array}{r} .267 \\ + 5.869 \\ \hline ? \end{array}$	REVIEW: adding integers, tenths, hundredths, and thousandths; two and three addends. Some regrouping.
20	$\begin{array}{r} 3.180 \\ 6.000 \\ + 2.479 \\ \hline ? \end{array}$	
21	$\begin{array}{r} 4.7 \\ - 2.3 \\ \hline ? \end{array}$	Subtracting tenths. Minuends from .9 through 9.9; subtrahends from .1 through 9.8. No regrouping.
22	$\begin{array}{r} 6.0 \\ - 3.7 \\ \hline ? \end{array}$	Subtracting tenths. Minuends from 1.0 through 9.9; subtrahends from .1 through 9.8. Some regrouping.
23	$\begin{array}{r} 2.78 \\ - .34 \\ \hline ? \end{array}$	Subtracting hundredths. Minuends from .09 through 9.99; subtrahends from .01 through 9.98. No regrouping.

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Level	Sample Problem	Skill Description
24	$\begin{array}{r} 3.40 \\ - 1.79 \\ \hline ? \end{array}$	Subtracting hundredths. Minuends from 1.0 through 9.99; subtrahends from .01 through 9.98. Some regrouping.
25—26	$\begin{array}{r} 7.8 \\ - .8 \\ \hline ? \end{array}$ $\begin{array}{r} 6.56 \\ - 3.01 \\ \hline ? \end{array}$	REVIEW: subtracting tenths and hundredths. Minuends from .09 through 9.999; subtrahends from .01 through 9.98. Some regrouping.
27	$\begin{array}{r} 5.974 \\ - 2.801 \\ \hline ? \end{array}$	Subtracting thousandths. Minuends from .009 through 9.999; subtrahends from .001 through 9.998. No regrouping.
28	$\begin{array}{r} 5.647 \\ - 2.801 \\ \hline ? \end{array}$	Subtracting thousandths. Minuends from .009 through 9.999; subtrahends from .001 through 9.998. No regrouping.
29—30	$\begin{array}{r} 9.700 \\ - 2.468 \\ \hline ? \end{array}$	REVIEW: subtracting tenths, hundredths, and thousandths. Minuends from 1.0 through 9.999; subtrahends from .001 through 9.998. Some regrouping.
31	$\begin{array}{l} .47 \times .3 = ? \\ 2.079 \times .76 = ? \end{array}$	Finding the number of decimal places in product (multiplication); numbers from .1 through 9.999.
32	$2.145 \times 10 = ?$	Multiplying 10, 100, and 1000 by decimal values; multiplier with tenths, hundredths, and thousandths.
33	$4.1 \times 100 = ?$	
34	$6.13 \times 1000 = ?$	
35	REVIEW (multiplicand is 10, 100, or 1000).	

Level	Sample Problem	Skill Description
36	$.7 \div 10 = ?$	Dividing decimals by 10, 100, 1000; dividend with tenths, hundredths, and thousandths.
37	$3.6 \div 100 = ?$	
38	$1.178 \div 1000 = ?$	
39	REVIEW (divisor is 10, 100, or 1000)	
40	$\begin{array}{r} .009 \\ \times .8 \\ \hline ? \end{array}$	Finding the number of decimal places in product (multiplication); factors are tenths, hundredths, or thousandths.
41	$\begin{array}{r} 8.4 \\ \times 4 \\ \hline ? \end{array}$	Multiplying tenths by whole numbers. Multiplicands from .1 through 9.9; multipliers from 1 through 20. Regrouping.
42—43	$\begin{array}{r} .2 \\ \times .3 \\ \hline ? \end{array}$	Multiplying tenths by tenths. Multiplicands from .1 through 9.9; multipliers from .1 through 9.9. Regrouping.
44—45	$\begin{array}{r} 3.08 \\ \times 1.9 \\ \hline ? \end{array}$	Multiplying hundredths by tenths. Multiplicands from .01 through 9.99; multipliers from .1 through 9.9. Regrouping.
46—47	$\begin{array}{r} .478 \\ \times .8 \\ \hline ? \end{array}$	Multiplying thousandths by tenths. Multiplicands from .001 through 9.999; multipliers from .1 through 9.9. Regrouping.
48—49	$\begin{array}{r} 2.178 \\ \times .23 \\ \hline ? \end{array}$	Multiplying thousandths by hundredths. Multiplicands from .001 through 9.999; multipliers from .01 through 9.99. Regrouping.



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Level	Sample Problem	Skill Description
50	$4 \overline{) 24.8} \quad ?$	Dividing decimals by whole numbers Divisors from 2 through 9. Dividends from 10 through 99.999. No remainders.
51	$.4 \overline{) 848} \quad ?$	Dividing whole numbers by tenths. Divisors from .2 through .9; dividends from 10 through 999. No remainders.
52	$.2 \overline{) 4.28} \quad ?$	Dividing decimals by tenths. Divisors from .2 through .9; dividends from 1.0 through 9.99. No remainders.
53—54	$.03 \overline{) 2.87} \quad ?$	Dividing decimals by hundredths. Divisors from .02 through .09; dividends from 1.0 through 99.99. No remainders.
55—56	$.2 \overline{) 47.8} \quad ?$	REVIEW: dividing decimals by tenths and hundredths. Divisors from .02 through .99; dividends from 1.0 through 99.99. Remainders.

## GLOSSARY

**Addend:** A number to be added to another; for example,  $\text{ADDEND} + \text{ADDEND} = \text{SUM}$

**Digit:** Any of the numerals 0 to 9; for example, the numeral "986" has three digits.

**Dividend:** A number that is divided by another.

**Divisor:** A number by which another number is divided.

**Factor:** Any numbers that when multiplied together form a product. Multiplicands and multipliers are both factors.

**Multiple:** A number into which another can be divided with zero remainder.

**Multiplicand:** A number that is multiplied by another.

**Multiplier:** A number by which another number is multiplied.

**Minuend:** A number from which a number (subtrahend) is to be subtracted.

$$\begin{array}{r} \text{MINUEND} \\ - \text{SUBTRAHEND} \\ \hline \text{DIFFERENCE} \end{array}$$

**Product:** The result of two numbers multiplied together.

$$\text{MULTIPLIER} \times \text{MULTIPLICAND} = \text{PRODUCT}$$

$$\begin{array}{r} \text{MULTIPLICAND} \\ \times \text{MULTIPLIER} \\ \hline \text{PRODUCT} \end{array}$$

**Quotient:** The result of one number divided by another.

$$\text{DIVIDEND} \div \text{DIVISOR} = \text{QUOTIENT}$$

$$\begin{array}{r} \text{QUOTIENT} \\ \text{DIVISOR} \overline{) \text{DIVIDEND}} \end{array}$$

**Regrouping:** A process in arithmetic in which numbers are formed into a new grouping. This has traditionally been called "carrying" or "borrowing."

**Remainder:** After division, the final undivided part that is less than the divisor.

**Subtrahend:** Number that is subtracted from a minuend; second number in a subtraction problem.

**Sum:** Total or result of adding numbers (addends) together; for example,

$$\text{SUM} = \text{ADDEND} + \text{ADDEND}$$

## **CARING FOR THE CARTRIDGE**

These cartridges are durable devices, but they should be handled with the same care you would give any other piece of electronic equipment. Keep the cartridge clean and dry, and don't touch the recessed contacts.

### **CAUTION:**

The contents of a Solid State Cartridge can be damaged by static electricity discharges.

Static electricity build-ups are more likely to occur when the natural humidity of the air is low (during winter or in areas with dry climates). To avoid damaging the cartridge, just touch any metal object (a doorknob, a desk lamp, etc.) before handling the cartridge.

If static electricity is a problem where you live, you may want to buy a special carpet treatment that reduces static build-up. These commercial preparations are usually available from local hardware and office supply stores.

## **IN CASE OF DIFFICULTY**

If the cartridge activities do not appear to be operating properly, return to the master title screen by pressing **QUIT**. Withdraw the cartridge, align it with the cartridge opening, and reinsert it carefully. Then press any key to make the master selection screen appear. (*Note:* In some instances, it may be necessary to turn the computer off, wait several seconds, and then turn it on again.)

If the cartridge is accidentally removed from the slot while the cartridge contents are being used, the computer may behave erratically. To restore the computer to normal operation, turn the computer console off, and wait a few seconds. Then, reinsert the cartridge, and turn the computer on again.

If you have any difficulty with your computer or cartridge, please contact the dealer from whom you purchased the unit and/or cartridge for service directions.

Additional information concerning use and service can be found in your *User's Reference Guide*.

Texas Instruments invented the integrated circuit,  
the microprocessor, and the microcomputer.  
Being first is our tradition.



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