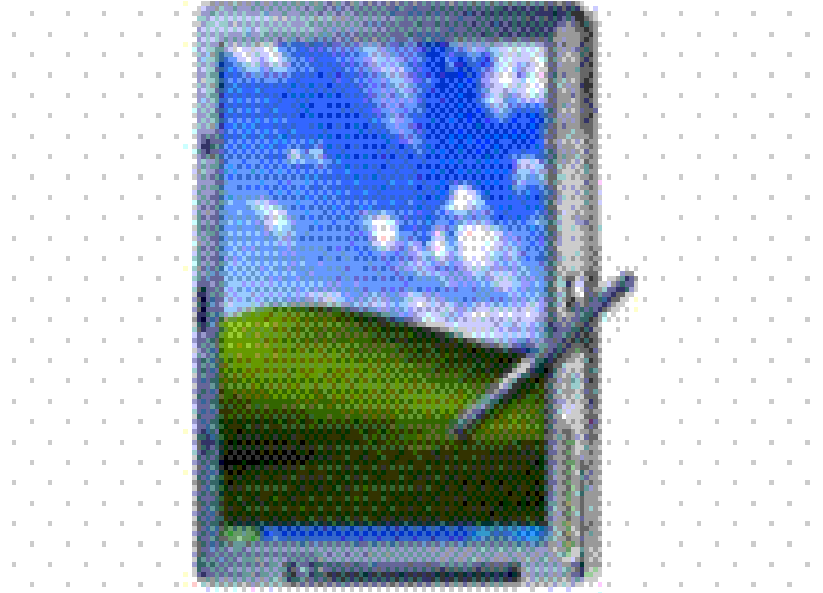




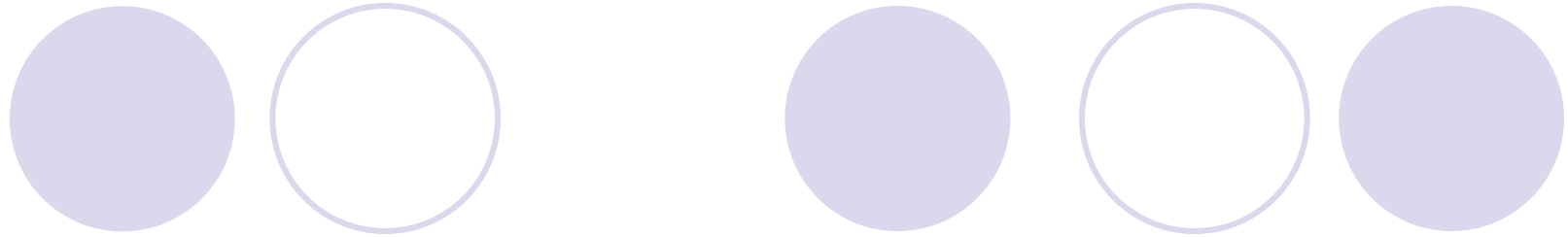
The Evolution of the Chalkboard:

Presentation by:
Kristi Schmid
Columbus State Community College
kschmid1@csc.edu

AMATYC Conference, 2007



The Tablet PC!



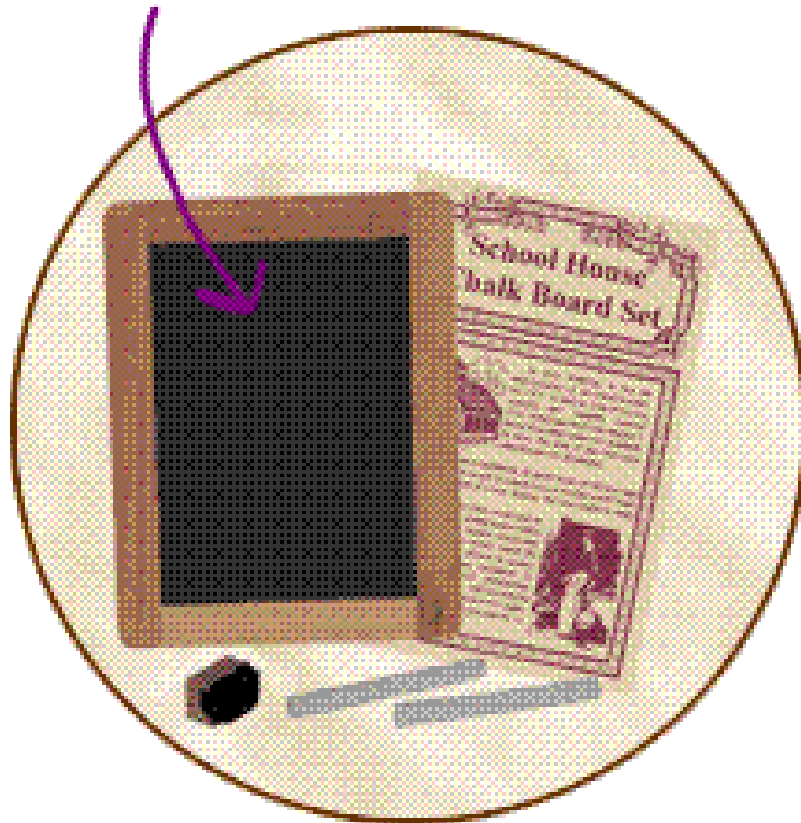
As a result of this presentation, you will:

- Take a trip through time. . .
- Think about advantages of the Tablet PC over the traditional chalkboard. . .
- Hear what students have to say about it. . .
- Think about your own pedagogical style. . .
- Be inspired by classroom examples. . .
- View a demonstration. . .
- Have the opportunity to share ideas and experiences. . .
- Have the opportunity to discuss questions & concerns. . .
- Be empowered and inspired!

A TRIP THROUGH TIME. . .

19th Century

Slate Board



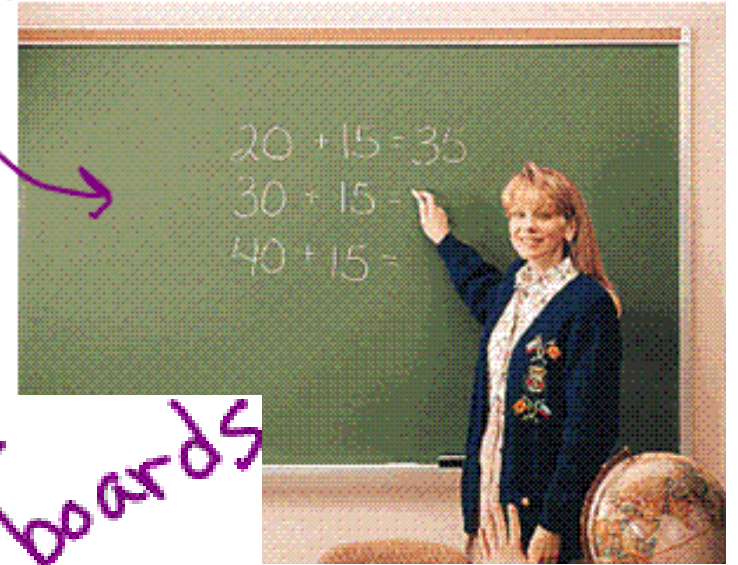
1907 (the turn of the century)



slate board
on the wall

20th Century

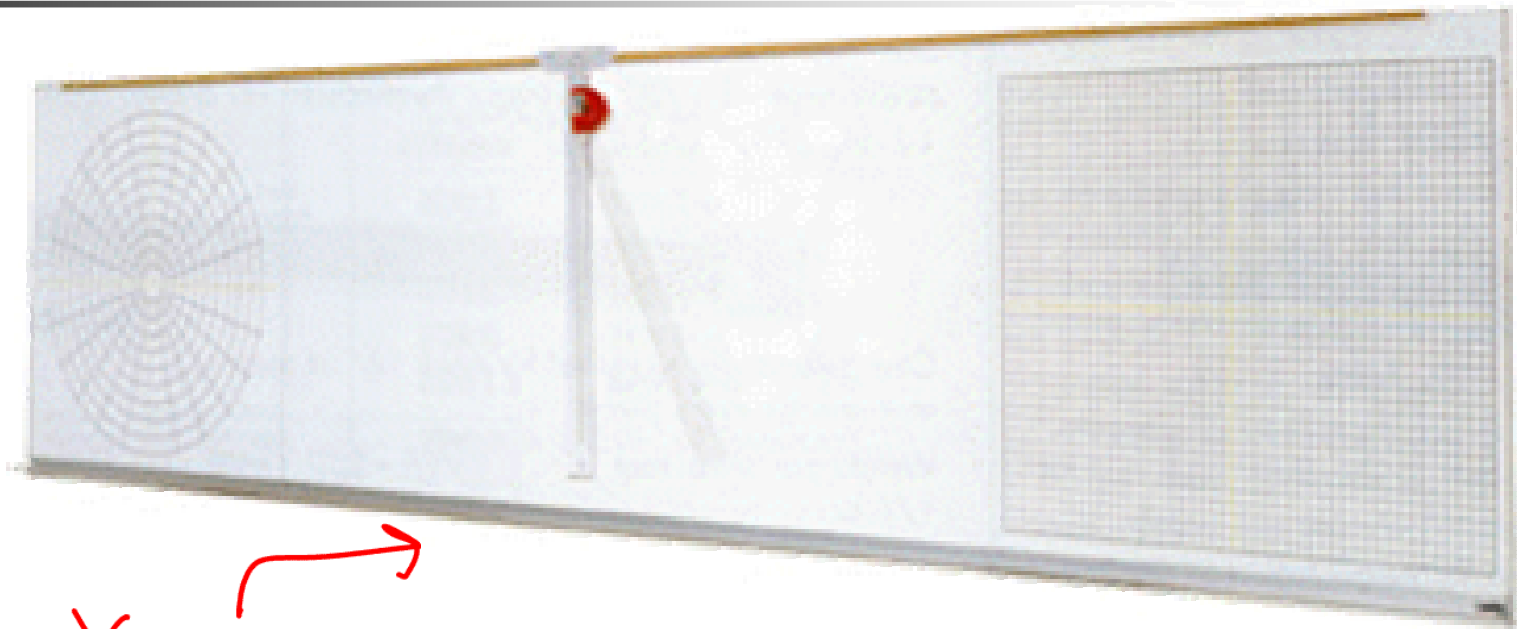
Traditional chalkboard
in various colors



with
cork boards



20th Century (Advanced Boards)



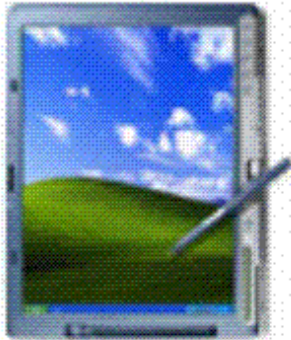
Math Boards
with Rectangular
& Polar Coordinate Grids

20th Century (Advanced Boards)



Sliding
Boards

The 21st Century

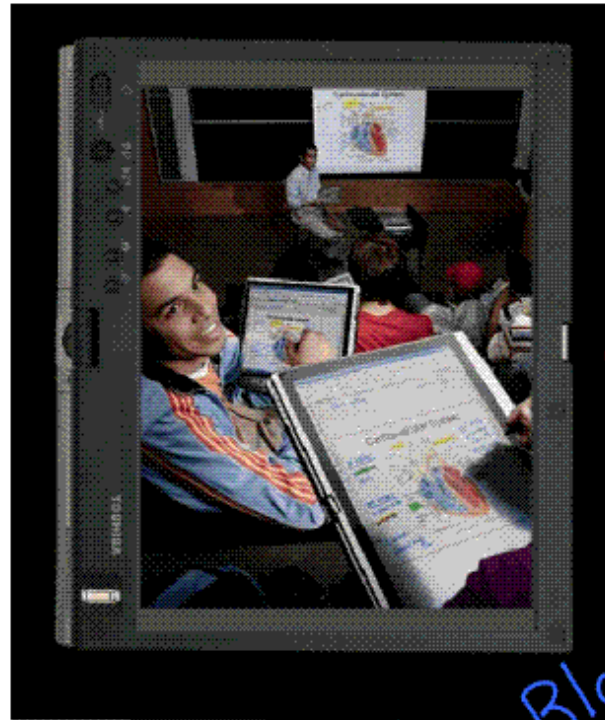


Tablet PCs

Distance Learning

Hybrid
Classes

Smart Boards



Smart
Classrooms

WebCT

BlackBoard
On-Line



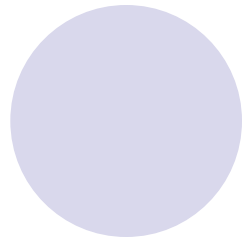
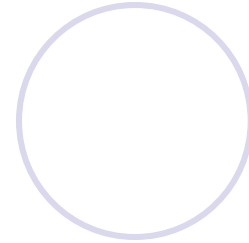
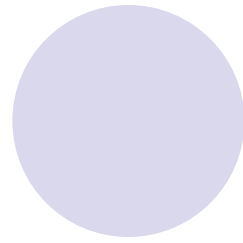
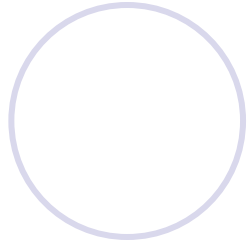
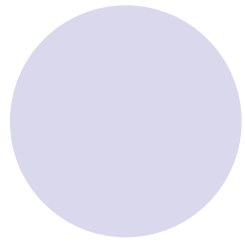
What are some advantages?

- Tablet PC is a portable chalkboard! (home to car to office to class to car to Starbucks to home, etc. . .)
- Can prepare notes with graphs, images, outlines before class.
- Can insert space while writing, scroll down/up, use colors to highlight, insert images instantaneously, access the web, pull up old files, create new files, etc. . .**ALL DURING THE LECTURE!**
- Information is not lost like it is when you erase the chalkboard. Don't erase, just scroll!
- Stylus ink can serve as a pointer for easier communication.



Advantages cont. . .

- Can use split screens to view calculator emulation software along side of class notes. Can view multiple representations simultaneously (e.g. Table of Values, Equation, Graph, Handwritten Work- all on the same screen)!
- No need for transparencies or calculator ViewScreens. Calculator is in the computer and is more versatile, just drag and drop screen shots into Journal document and mark them up with your stylus pen!
- Captures class notes for you and your students. Quickly prints to PDF with the click of the mouse.
- Can upload class notes to the internet for students to study.



Student Comments. . .



Pedagogy Defined. . .

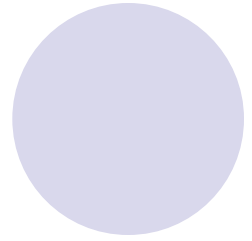
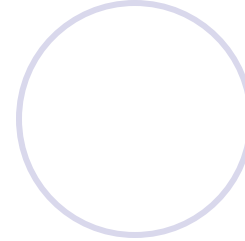
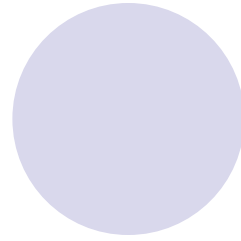
ped•a•go•gy *n*(1583): the art, science, or profession of teaching.

The. . . *ART* . . . of teaching.

It's in the *Design* . . .

- Your flare.
- Your style.
- *Your handwriting.*
- Your instructional design.
- Let your creative juices flow!

Inspiration...



Some classroom examples:

EX 1

Prepare before class. Students can print from internet or you can bring copies for them to fill out.

A plumber charges \$50 per house visit and \$35 per hour.

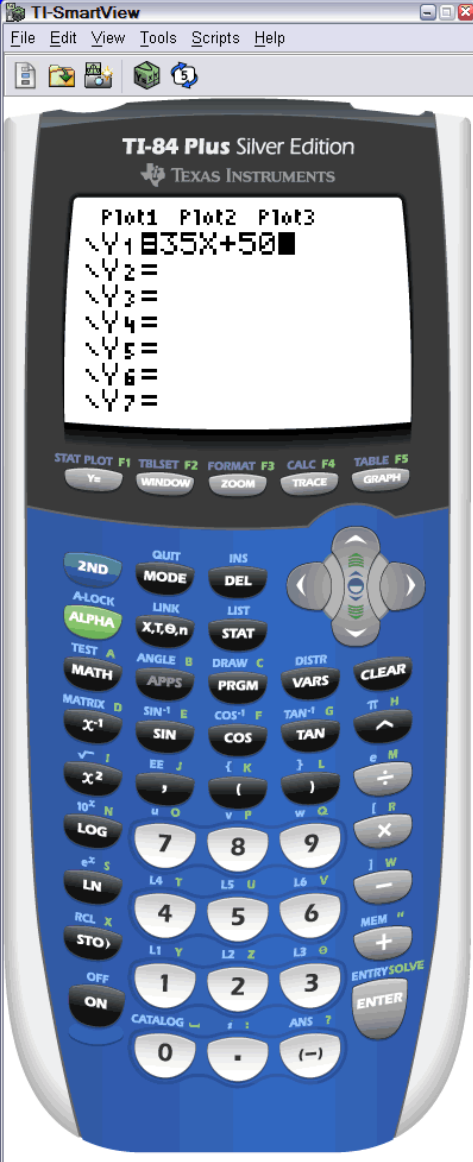
a) Write an equation for the plumber's total charge y , given the number of hours, x for a single job.

b) Use a table to find the plumber's total charge for a job that could take 1 to 4 hours.

a) Equation:

b) Table:

Projected on screen for students during class. This is the “chalkboard” they see!



TI-84 Plus Silver Edition
TEXAS INSTRUMENTS

Plot1 Plot2 Plot3
Y1=35X+50
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=

plumberDuring - Windows Journal

A plumber charges \$50 per house visit and \$35 per hour.

a) Write an equation for the plumber's total charge y , given the number of hours, x for a single job.

b) Use a table to find the plumber's total charge for a job that could take 1 to 4 hours.

Drag and Drop Screen Image with pen or mouse

a) Equation:

$y = 50 + 35x$
OR $y = 35x + 50$

b) Table:

X	Y1
1	85
2	120
3	155
4	190

If $x = 3$
 $y = 35(3) + 50$
 $= 105 + 50$
 $= 155$

If he works 3 hours, he will earn \$155.

After class, print as PDF and upload to internet for students to study!

A plumber charges \$50 per house visit and \$35 per hour.

- a) Write an equation for the plumber's total charge y , given the number of hours, x for a single job.

- b) Use a table to find the plumber's total charge for a job that could take 1 to 4 hours.

a) Equation:

$y = 50 + 35x$
OR $y = 35x + 50$

```
Plot1 Plot2 Plot3
Y1=35X+50
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
```

b) Table:

```
TABLE SETUP
TblStart=1
ΔTbl=1
Indent: Auto Ask
Depend: Auto Ask
```

X	Y1
1	85
2	120
3	155
4	190

X=

If $x=3$
 $y = 35(3) + 50$
 $= 105 + 50$
 $= 155$

If he works 3 hours, he will earn \$155.

Blank outline available and ready for the next class or for next quarter!

A plumber charges \$50 per house visit and \$35 per hour.

- a) Write an equation for the plumber's total charge y , given the number of hours, x for a single job.

- b) Use a table to find the plumber's total charge for a job that could take 1 to 4 hours.

a) Equation:

b) Table:

EX 2 Import a quiz or test and write out the solutions! Can print as PDF for easy internet upload.

Quiz Three Solns.pdf - Adobe Reader

File Edit View Document Tools Window Help

1 / 4 71.2%

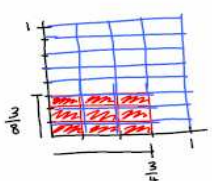
Find

Quiz Three
Spring, 2007
Math 105 - Schmid

Name Key

This quiz is worth a total of 15 points. Show your work and explain your reasoning clearly when asked.

1. Draw an array to illustrate and state your solution clearly. $\frac{3}{4} \times \frac{3}{8}$



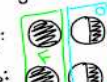
Solution: $\frac{9}{32}$ ← 9 pieces being counted
← 32 equal size pieces in the whole


CK $\frac{3}{4} \cdot \frac{3}{8} = \frac{3 \cdot 3}{4 \cdot 8} = \frac{9}{32}$ ✓

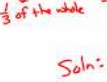
2. Use the FOIL method to Calculate using the FOIL method (showing all work). Draw a picture to illustrate this problem. Identify the four terms produced by the FOIL method. $2\frac{1}{3} \times 1\frac{1}{2}$

$2\frac{1}{3} \times 1\frac{1}{2}$
 $= (2 + \frac{1}{3})(1 + \frac{1}{2})$
 $= 2(1) + 2(\frac{1}{2}) + 1(\frac{1}{3}) + \frac{1}{3} \cdot \frac{1}{2}$
 $= 2 + 1 + \frac{1}{3} + \frac{1}{6}$
 $= 3 + \frac{2}{6} + \frac{1}{6}$
 $= 3 + \frac{3}{6}$
 $= 3 + \frac{1}{2}$
 $= 3\frac{1}{2}$

$2\frac{1}{3}$ groups of $1\frac{1}{2}$

1 group: 

1 group: 

$\frac{1}{3}$ group: 

$\frac{1}{3}$ of the whole $\frac{1}{3}$ of the $\frac{1}{2} = \frac{1}{6}$

Soln: $3\frac{3}{6} = 3\frac{1}{2}$ ✓

3. Explain how you know where to put the decimal point in 1.258×3.75 . Calculate using the standard algorithm. Why does this process work?

How you know:
Since the first number has 3 digits to the right of the decimal and the second number has 2 digits to the right of the decimal, the solution must have $3+2=5$ digits to the right of its decimal.


1.258
 $\times 3.75$
 \hline
 88060
 377400
 \hline
 471750
 \hline
 4.7175


4. Show how to multiply 1.2×3.2 using base ten blocks. You must identify which block is in the one's place or which place-value the small cube represents. State your solution clearly.


Why it works:
The algorithm says to multiply as whole numbers. To do this we must multiply the first factor by 10 three times and the second factor by 10 two times. Since we multiplied by 10 a total of five times, we must undo this by dividing by 10 five times in the solution.

This works because:
 $1.258 = \frac{1258}{1000}$ $3.75 = \frac{375}{100}$
 So, 1.258×3.75
 $= \frac{1258}{1000} \times \frac{375}{100}$
 $= \frac{1258}{10 \times 10 \times 10} \times \frac{375}{10 \times 10}$
 $= \frac{471750}{10 \times 10 \times 10 \times 10 \times 10}$

1.2 groups of 3.2

1 group: 

1/10 of a group: 

1/100 of a group: 

Soln: 3.84

ones place: flat (Since the soln will have 2 digits to the right of the decimal)

flats longs small cubes

CK 1.2
 $\times 3.2$
 \hline
 24
 360
 \hline
 3.84

EX 3 Import web documents to facilitate classroom discussions. This is from MyMathLab. Can upload this as PDF to internet.

mgintergraph3e_05_062 - Windows Journal

File Edit View Insert Actions Tools Help

EXAMPLE 1

Factor $x^2 - 10x + 16$.

Solution We look for two integers whose product is 16 and whose sum is 10. Since our integers must have a positive product and a positive sum, we look at only positive factors of 16.

Positive Factors of 16	Sum of Factors
1, 16	$1 + 16 = 17$
4, 4	$4 + 4 = 8$
2, 8	$2 + 8 = 10$ <i>Correct pair</i>

The correct pair of numbers is 2 and 8 because their product is 16 and their sum is 10. Thus,

$$x^2 + 10x + 16 = (x + 2)(x + 8)$$

Check: To check, see that $(x + 2)(x + 8) = x^2 + 10x + 16$.

Technology Note

Just as a graphing utility can be used to visualize the multiplication of polynomials, a graphing utility can also be used to visualize the factorization of a polynomial. For example, to visualize the factorization from Example 1, graph $y_1 = x^2 + 10x + 16$ and $y_2 = (x + 2)(x + 8)$ and see that the graphs coincide.

Section 5.5

$x^2 + 10x + 16$

~~1 4~~
~~1 4~~
 $4 + 4$ NO

~~1 2~~
~~1 8~~
 $8 + 2$ YES

$= (x + 8)(x + 2)$

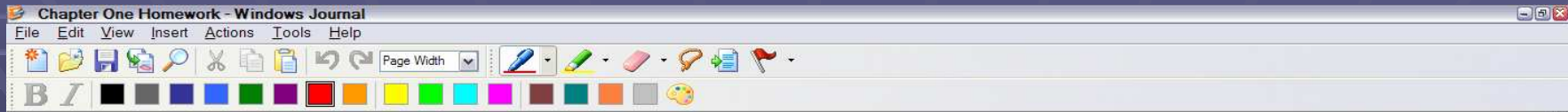
EXAMPLE 2

Factor $x^2 - 12x + 35$.

2

start Tablet Presentation 103H Recitation Notes Microsoft PowerPoin... Note 1 - Windows Jo... Test One Fall 2007 ... mgintergraph3e_05... mgintergraph3e_05... 2/8 10:35 AM

EX 4 Use of color and highlighting. Expressions can be written naturally for students on your virtual chalkboard!



Class Size: 5 Students
(Joe, Sue, Amy, Tom, Kim)
Make a chart to show possible pairs:

	Joe	Sue	Amy	Tom	Kim
Joe	Joe, Joe	Joe, Sue	Joe, Amy	Joe, Tom	Joe, Kim
Sue	Sue, Joe	Sue, Sue	Sue, Amy	Sue, Tom	Sue, Kim
Amy	Amy, Joe	Amy, Sue	Amy, Amy	Amy, Tom	Amy, Kim
Tom	Tom, Joe	Tom, Sue	Tom, Amy	Tom, Tom	Tom, Kim
Kim	Kim, Joe	Kim, Sue	Kim, Amy	Kim, Tom	Kim, Kim

chart shows n^2 (5×5)
shown in yellow

$$\frac{n(n-1)}{2} = \frac{5(5-1)}{2}$$

$$= \frac{5 \cdot 4}{2}$$

$$= \frac{20}{2}$$

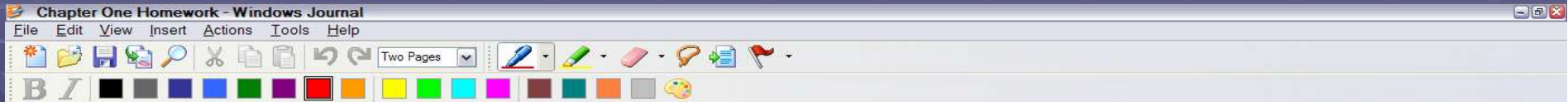
$$= \boxed{10 \text{ pairs}}$$

$$\frac{n(n-1)}{2}$$

$$= \frac{n^2 - n}{2}$$

$$= \frac{5^2 - 5}{2} = \frac{25 - 5}{2} = \frac{20}{2}$$

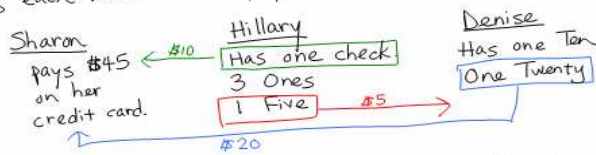
EX 5 More personal in your own handwriting. Students love it!



Chapter One Homework

p. 11: 1-4

- ① Since they split the bill evenly and the total bill is \$45, each woman must pay \$15. ($45 \div 3 = 15$)



Denise will give Sharon her Twenty. Hillary will give Denise her Five. Now Denise has paid her fifteen by giving up twenty dollars and receiving five dollars back. ($-20 + 5 = -15$) Hillary has paid out five dollars (to Denise), so she still owes ten dollars. She will write a check for \$10 and give it to Sharon. Now Sharon has received a total of \$30, making it so that she's paid only \$15. ($-45 + 30 = -15$). Hillary has paid \$15, \$5 to Denise and \$10 to Sharon. ($-5 + -10 = -15$). Likewise, Denise has paid \$15, \$20 to Sharon receiving \$5 back from Hillary ($-20 + 5 = -15$). Thus, each woman ended up paying the same amount of \$15.

- ② There are 35 different pairs of lunches possible. Since there are 5 reduced fat and 7 regular lunches, each reduced fat lunch can be paired with exactly 7 other lunches. So the answer is 35. ($7 \times 5 = 35$)

$$\begin{array}{l}
 1^{\text{st}} \text{ red. fat} \times 7 = 7 \text{ pairs} \\
 2^{\text{nd}} \text{ red. fat} \times 7 = 7 \text{ pairs} \\
 3^{\text{rd}} \text{ red. fat} \times 7 = 7 \text{ pairs} \\
 4^{\text{th}} \text{ red. fat} \times 7 = 7 \text{ pairs} \\
 5^{\text{th}} \text{ red. fat} \times 7 = 7 \text{ pairs} \\
 \hline
 35 \text{ Total Pairs}
 \end{array}$$

$$\begin{array}{l}
 7 + 7 + 7 + 7 + 7 = 35 \\
 \text{or} \\
 7 \times 5 = 35
 \end{array}$$

- ③ This is exactly like the "clinking glasses" problem. Each student is paired with all of the other students exactly once.

$$\begin{array}{l}
 \text{student one} \times 23 \text{ (other students)} = 23 \text{ pairs} \\
 \text{student 2} \times 22 \text{ (students left)} = 22 \text{ pairs} \\
 \vdots \\
 \vdots \\
 \text{student 23} \times (1 \text{ student left}) = 1 \text{ pair}
 \end{array}$$

$$23 + 22 + 21 + 20 + \dots + 4 + 3 + 2 + 1 = 276 \text{ total pairs}$$

$$\text{Formula: } \frac{n(n-1)}{2} = \frac{24(23)}{2} = 276$$

"2" Divide by 2 to account for duplicate pairs.
Joe with Sue } same pair
Sue with Joe }

"(n-1)": subtract 1 because a student can't be paired with him(herself).

It helps to make sense of the formula by using a smaller class size.

See below:

$$\text{Recall: } \frac{n(n-1)}{2} \text{ can also be written as } \frac{n^2 - n}{2}$$

EX 6 Problems worked out for students on notebook style paper.



1.5 HW p.53: 23-28, 29-57 odd, 59-62, 63-77 odd

24) $\frac{x}{2} + \frac{x}{3} = \frac{5}{2}$

$\frac{6}{1} \cdot \frac{x}{2} + \frac{6}{1} \cdot \frac{x}{3} = \frac{6}{1} \cdot \frac{5}{2}$ mult both sides by LCD = 6

$3x + 2x = 15$
 $5x = 15$
 $x = 3$

ck
 $3 \rightarrow x$
 $\frac{x}{2} + \frac{x}{3}$
 2.5
 Ans → Frac $5/2$ ✓

26) $\frac{4r}{5} - 7 = \frac{r}{10}$

$\frac{10}{1} \cdot \frac{4r}{5} - 10 \cdot 7 = \frac{10}{1} \cdot \frac{r}{10}$
 $8r - 70 = r$
 $-r - 70 = -70$
 $7r = 70$
 $r = 10$

ck
 $10 \rightarrow r$
 $(4R)/5 - 7$
 $R/10$
 ✓

28) $\frac{2+h}{9} + \frac{h-1}{3} = \frac{1}{3}$

$\frac{2}{1} \left(\frac{2+h}{9} \right) + \frac{2}{1} \left(\frac{h-1}{3} \right) = \frac{2}{1} \cdot \frac{1}{3}$
 $2+h + 3(h-1) = 3$
 $2+h + 3h - 3 = 3$
 $4h - 1 = 3$
 $4h = 4$
 $h = 1$

ck
 $1 \rightarrow h$
 $((2+h)/9) + ((h-1)/3)$
 $.33333...$
 Ans → Frac $1/3$ ✓

(29-57 odd) You have these answers, if you have questions e-mail me

(59-62)

60) $4 - \frac{2z+7}{9} = \frac{7-z}{12}$

$36 \cdot 4 - \frac{36}{1} \cdot \left(\frac{2z+7}{9} \right) = \frac{36}{1} \left(\frac{7-z}{12} \right)$

$144 - 4(2z+7) = 3(7-z)$

$144 - 8z - 28 = 21 - 3z$
 $116 - 8z = 21 - 3z$
 $95 = 5z$
 $19 = z$

ck
 $19 \rightarrow z$
 $4 - ((2z+7)/9)$
 $(7-z)/12$
 19
 -1
 -1 ✓

62) $\frac{n+1}{8} - \frac{2-n}{3} = \frac{5}{6}$

$\frac{24}{1} \left(\frac{n+1}{8} \right) - \frac{24}{1} \left(\frac{2-n}{3} \right) = \frac{24}{1} \cdot \frac{5}{6}$

$3(n+1) - 8(2-n) = 4 \cdot 5$
 $3n+3 - 16+8n = 20$
 $11n-13 = 20$
 $11n = 33$
 $n = 3$

ck
 $3 \rightarrow n$
 $((n+1)/8) - ((2-n)/3)$
 $.833333...$
 Ans → Frac $5/6$ ✓

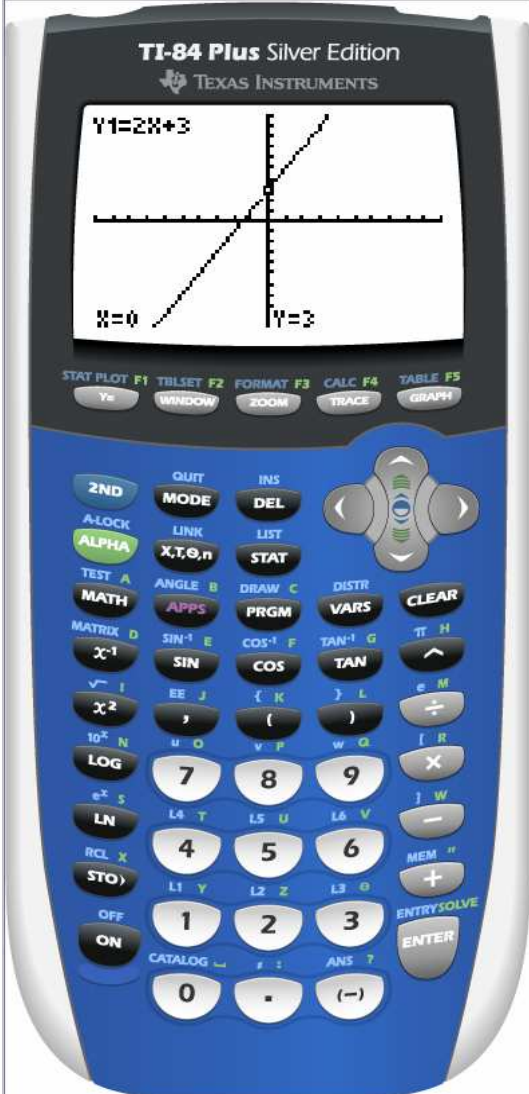
(63-73 odd) in book - Ask if you have questions!

75) $-2(b-4) - (3b-1) = 5b+3$

$-2b+8-3b+1 = 5b+3$
 $-5b+9 = 5b+3$
 $6 = 10b$
 $\frac{6}{10} = b$
 $\frac{3}{5} = b$ Reduce!

ck $3/5 \rightarrow b$
 $-2(b-4) - (3b-1)$
 $5b+3$
 6
 6 ✓

EX 7 Multiple Representations on Same Screen.



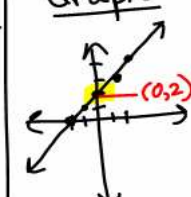
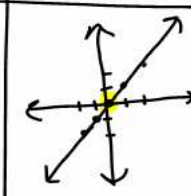
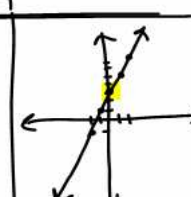
TI-84 Plus Silver Edition
TEXAS INSTRUMENTS

Y1=2X+3

X=0 Y=3

6 Columns - Windows Journal

6 Columns **"b" is highlighted in each column**

Equation	Linear Function $f(x) = mx + b$	Table of Values	Graph	Evaluate $f(0)$	y-intercept												
① $y = x + 2$	$f(x) = x + 2$	<table border="1" style="font-size: small;"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>0</td></tr> <tr><td>-1</td><td>1</td></tr> <tr><td>0</td><td>2</td></tr> <tr><td>1</td><td>3</td></tr> <tr><td>2</td><td>4</td></tr> </table>	x	y	-2	0	-1	1	0	2	1	3	2	4		$f(x) = x + 2$ $f(0) = 0 + 2$ $f(0) = 2$	$(0, 2)$
x	y																
-2	0																
-1	1																
0	2																
1	3																
2	4																
② $y = x$	$f(x) = x + 0$	<table border="1" style="font-size: small;"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>-2</td></tr> <tr><td>-1</td><td>-1</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>2</td><td>2</td></tr> </table>	x	y	-2	-2	-1	-1	0	0	1	1	2	2		$f(0) = 0$ $f(x) = x + 0$ $f(0) = 0 + 0$	$(0, 0)$
x	y																
-2	-2																
-1	-1																
0	0																
1	1																
2	2																
③ $y = 2x + 3$	$f(x) = 2x + 3$	<table border="1" style="font-size: small;"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>-1</td></tr> <tr><td>-1</td><td>1</td></tr> <tr><td>0</td><td>3</td></tr> <tr><td>1</td><td>5</td></tr> <tr><td>2</td><td>7</td></tr> </table>	x	y	-2	-1	-1	1	0	3	1	5	2	7		$f(0) = 3$	$(0, 3)$
x	y																
-2	-1																
-1	1																
0	3																
1	5																
2	7																

TI-SmartView interface details:

- TI-SmartView window: TI-84 Plus Silver Edition, Y1=2X+3, X=0, Y=3.
- 6 Columns - Windows Journal window: Title "6 Columns", subtitle "'b' is highlighted in each column".
- Handwritten notes: "6 Columns", "'b' is highlighted in each column".
- Table with 6 columns: Equation, Linear Function, Table of Values, Graph, Evaluate f(0), y-intercept.
- Three rows of data for different linear functions: y = x + 2, y = x, and y = 2x + 3.
- Handwritten calculations for f(0) and y-intercepts.
- TI-84 Plus calculator image on the left showing the same function and graph.

Quick upload after class!

6 Columns **"b" is highlighted in each column**

Equation	Linear Function $f(x) = mx + b$	Table of Values	Graph	Evaluate $f(0)$	y-intercept												
① $y = x + 2$	$f(x) = x + 2$	<table border="1"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>0</td></tr> <tr><td>-1</td><td>1</td></tr> <tr><td>0</td><td>2</td></tr> <tr><td>1</td><td>3</td></tr> <tr><td>2</td><td>4</td></tr> </table>	x	y	-2	0	-1	1	0	2	1	3	2	4		$f(x) = x + 2$ $f(0) = 0 + 2$ $f(0) = 2$	$(0, 2)$
x	y																
-2	0																
-1	1																
0	2																
1	3																
2	4																
② $y = x$	$f(x) = x + 0$	<table border="1"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>-2</td></tr> <tr><td>-1</td><td>-1</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>1</td><td>1</td></tr> <tr><td>2</td><td>2</td></tr> </table>	x	y	-2	-2	-1	-1	0	0	1	1	2	2		$f(0) = 0$ $f(x) = x + 0$ $f(0) = 0 + 0$	$(0, 0)$
x	y																
-2	-2																
-1	-1																
0	0																
1	1																
2	2																
③ $y = 2x + 3$	$f(x) = 2x + 3$	<table border="1"> <tr><th>x</th><th>y</th></tr> <tr><td>-2</td><td>-1</td></tr> <tr><td>-1</td><td>1</td></tr> <tr><td>0</td><td>3</td></tr> <tr><td>1</td><td>5</td></tr> <tr><td>2</td><td>7</td></tr> </table>	x	y	-2	-1	-1	1	0	3	1	5	2	7	 	$f(0) = 3$	$(0, 3)$
x	y																
-2	-1																
-1	1																
0	3																
1	5																
2	7																

EX 8

Use highlighter to help students make connections. This is done with graph paper settings.

You Try!

Plot each ordered pair and name the quadrant in which it lies.

- * $(3, -2)$ IV
- * $(0, 3)$ y-axis
- * $(-4, 1)$ II
- * $(-1, 0)$ x-axis
- * $(-2\frac{1}{2}, -3)$ III
- * $(3.5, 4.5)$ I

What can you conclude about the signs (positive or negative) of the x-coordinate and y-coordinate for each quadrant?

EX 9 Create calculator supplements for web and hybrid students.

Compound Interest formula:

$$A = P \left(1 + \frac{r}{n} \right)^{n \cdot t}$$

P = principal (amount invested)
 r = annual rate of interest
 t = time in years
 n = # of times compounded per yr.

Ex 5 in book (p. 82)

2. Karen Estes just received an inheritance of \$10,000 and plans to place all of the money in a savings account that pays 5% compounded quarterly to help her son go to college in 3 years. How much money will be in the account in 3 years?

Soln: \$ 11,607.55

TI-SmartView
File Edit View Tools Scripts Help

Show/Hide Key Press History

Key Press History Large Screen

TI-84 Plus Silver Edition
TEXAS INSTRUMENTS

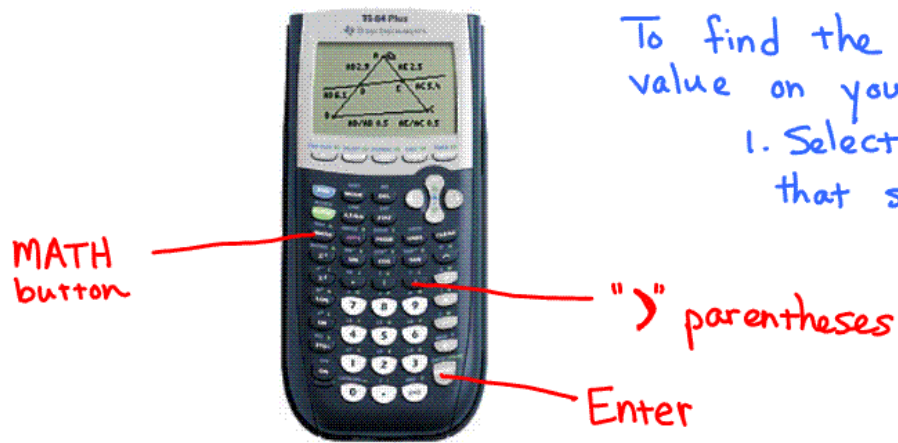
10000→P: .05→R: 4→
N: 3→T
P(1+R/N)^((N*T))
11607.54518

It's important to put parentheses around the entire exponent!

start TI-SmartView Compound Interest - ... 1:03 AM

EX 10 More calculator supplements. . .

Absolute Value on your calculator:



To find the absolute value on your calculator:

1. Select the button that says "MATH"

```
MATH NUM CPX PRB
1: abs(
2: round(
3: iPart(
4: fPart(
5: int(
6: min(
7: max(
```

2. Scroll right to "NUM"
3. Select 1: abs (

$$|-9| = 9$$

```
abs(-9)      9
█
```

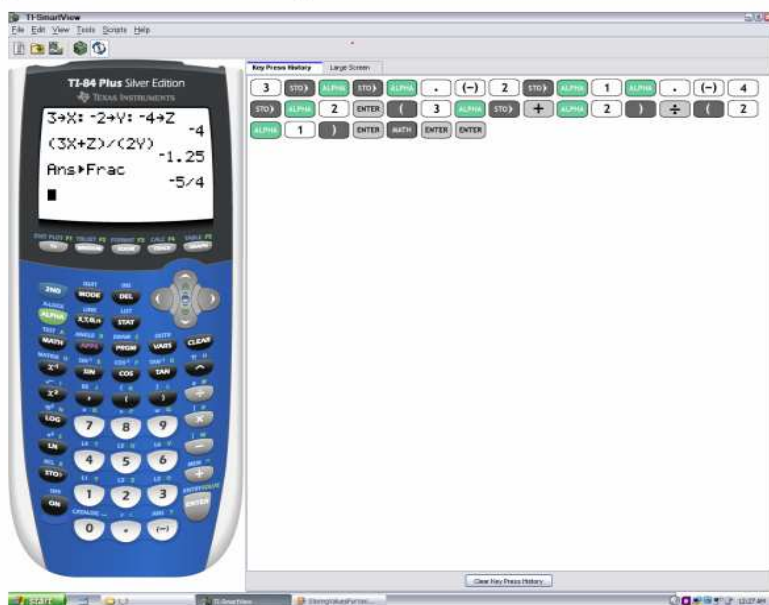
4. Enter the number you want to take the abs val of.

5. Finish the parentheses and press Enter.

EX 11 More calculator supplements. . .

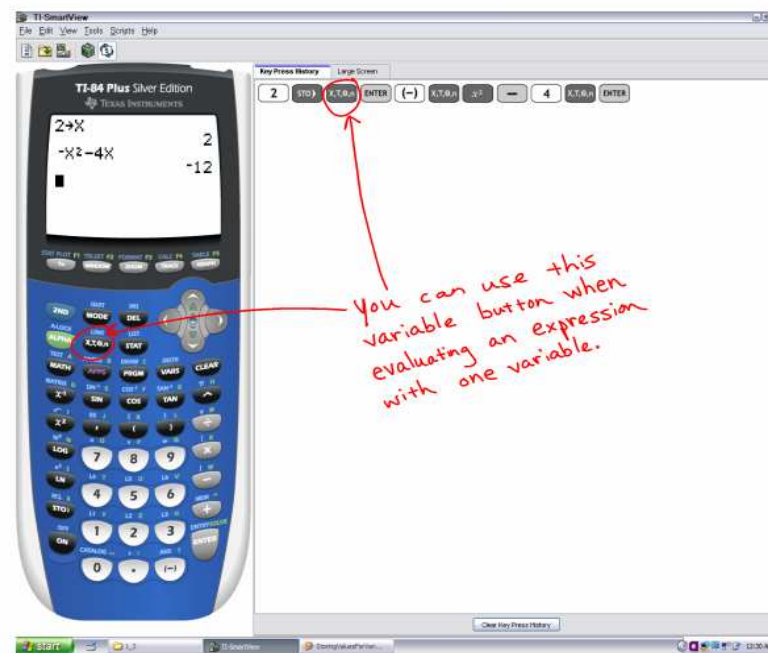


1.3
 Ex Evaluate $\frac{3x+z}{2y}$ when $x=3$, $y=-2$ and $z=-4$.
 Solution: $-\frac{5}{4}$



For just one variable, you don't need to use the Alpha button:

Ex Evaluate $-x^2-4x$ when $x=2$.
 Solution: -12



You can use this variable button when evaluating an expression with one variable.



Implementation. . .

What is best for students?

- **May differ from class to class, quarter to quarter.**
- **Consider Environment: Classroom, Hybrid, Web**
- **Consider Type of Class: Developmental, Math for Teachers, etc. . .**
- **Consider Available Resources: Smart Room, Media Cart, Media Support, BlackBoard, WebCT, Technical Support, etc. . .**
- **Not for the sake of the technology itself.**



Implementation. . .

- **Be realistic.**
- **Be flexible.**
- **Have a back-up plan at all times. (Bring chalk, dry erase markers, handouts, etc. . .)**
- **Expect difficulties to happen, because they will.**

Change is not instantaneous. . .



Continuous Improvement

A Columbus State motto is
“Continuous Improvement”.

(Change is progressive, not instantaneous.)

Experiment, Implement, Revise. . . .

Try Again. . . .

Experiment, Implement, Revise. . . .

Try Again. . . .

Experiment, Implement, Revise. . . .

Try Again. . . .

Experiment, Implement, Revise. . . .

Try Again. . . .



Discussion

- **Do you have any experiences to share?**
- **What ideas would you like to try?**
- **Do you have questions or concerns?**
-
-
- but, most importantly. . .
-
- **Are you empowered and inspired?**



Contact Me...

Feel free to contact me, if you have any questions!

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Columbus, OH 43216

The following resources were used in the making of this slide show:

- <http://www.historicalfolktoys.com/catalog/earlyed1.html>
- <http://hearingvoices.com/special/2005/school/>
- <http://www.toshibadirect.com/td/b2c/ebtext.to?page=tabletMicro>
- <http://www.whiteboardsetc.com>
- <http://www.microsoft.com>
- <http://www.pbs.org>
- <http://www.nyblackboard.com>
- <http://www.libertybellmuseum.com>
- <http://www.images.google.com>
- <http://www.white-boards-and-more.com>
- <http://www.historicalfolktoys.com>
- <http://www.flex-a-chart.com>
- <http://www.mymathlab.com>
- <http://education.ti.com/educationportal/sites/US/homePage/index.html>
- Webster's Dictionary

.....Thank You.....