STUDYCARDS^{TM} ON THE TI-83 PLUS

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What are StudyCards^{TM}?

StudyCards^{TM} are a calculator version of traditional paper "flash cards." Each electronic card has a "front" side that bears a question, and a "back" side that gives an answer. The questions are either free-response ("self-check") or multiple choice. Cards with "levels" require the reader to answer 80% of the cards in one level correctly before moving to the next level. Students can use StudyCards^{TM} for self-study, or pairs of students can work together using the cards to quiz one another. The TI-83 Plus Silver Edition calculator comes with the StudyCard^{TM} App already installed. The App can be downloaded from the TI web site ([1]) for TI-83 Plus calculators with version 1.10 or later of the operating system.

Sample StudyCard^{TM} stacks may be downloaded from Texas Instruments and from our web site, http://www.jcu.edu/math/ICTCM2003.

How do I view StudyCards^{TM} on my calculator?

Begin by choosing "StudyCrd" from the APPS menu, and select "Choose new stack" from the StudyCard^{TM} main menu. This will produce a list of StudyCard^{TM} stacks available on the calculator.

Each card in the stack has a front and a back, as shown below. The color of the options at the bottom of the screen indicates whether the front or the back of the card is showing. (See Figures 1 and 2.)
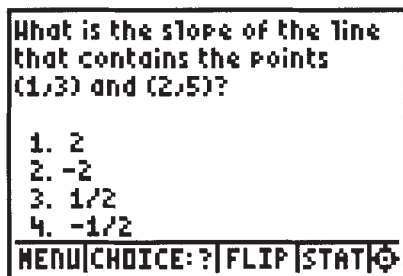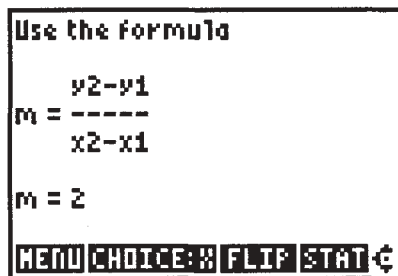
Figure 1: Front of card.   Figure 2: Back of card.

Access an option by pressing the graphing function key that appears below it. (Use $\boxed{\text{Y=}}$ for "Menu," $\boxed{\text{TRACE}}$ for "Flip," etc.) Move from one card to the next by using the left and right arrow keys. If a card is too big to fit on the calculator screen, the up and down arrow keys will scroll through it. On a multiple choice card, record an answer by pressing the appropriate number key; flipping a card before answering the question is recorded as an incorrect answer. Self-check stacks are different. After answering the question on the front of the card, look at the answer on the back. Choose "yes" if you answered correctly, and "no" otherwise.

After viewing each card in the stack, a menu of choices appears. Among other options, you can repeat your viewing of the cards in the stack or view your results.

What are the different settings for StudyCards[TM]?

Choose the settings you want for a particular stack by selecting "Settings" from the StudyCard[TM] main menu. Several of the settings control what happens after you have viewed every card in a stack.

- *Keep Known Cards* will cause every card in the stack to be presented again if you choose "repeat" from the menu at the end of the stack.
- *Re-Introduce Cards* will cause every card for which you gave an incorrect answer to be presented again if you choose "repeat" from the menu at the end of the stack. In addition, you will be presented with several cards that you answered correctly.
- *Shuffle Cards* presents the cards in a stack in random order.
- *Ignore Levels* turns off the feature that requires you to answer easy questions correctly before progressing to harder questions.
- *Animate Flip* shows the card being turned over.
- *5 Box Mode* essentially creates five "boxes," each containing a copy of the stack of cards. To complete each box, you must correctly answer each card in that box. When you answer a question incorrectly, that card is returned to the current box and to all previous boxes. Thus, to complete all five boxes, you must answer each question correctly on five consecutive tries.

How do I interpret the results of a StudyCard[TM] session?

Each question in a multiple choice stack has three possible results: a correct answer (C), an incorrect answer (I), or a skipped answer (S). Results for self-check stacks are recorded as yes (Y), no (N), or skipped (S). You can check your cumulative results for a stack at any time by choosing the "menu" option from the bottom of the screen. When you complete a stack, you will automatically be presented with this menu. When you choose "results" from the menu, you will see a table as in Figure 3 or Figure 4.

I	C	S	CARD NAME
4	1	0	Card 1
2	1	0	Card 3
1	1	1	Card 6
0	1	0	Card 4
0	3	0	Card 2
0	4	0	Card 5
BACK	SCORE:00023 OF 00030		

n	Y	S	CARD NAME
3	1	0	Inverse cosecant
2	1	0	secant
1	1	0	Inverse cotange
0	1	0	Inverse secant
0	1	0	Inverse cosine
0	1	0	cotangent
BACK	SCORE:00120 OF 00120		

Figure 3: Results for a
multiple choice stack.

Figure 4: Results for a
self-check stack.

The card that received the most incorrect answers (overall) appears first, the card with the most correct answers (overall) appears last, and the other cards are sorted accordingly. Some stacks are created to record point values for correct, incorrect, and skipped answers. If this is the case, the total score for the stack is also given on the "results" screen. In Figure 3 above, correct answers earned 5 points, incorrect answers earned −1 point, and skipped cards were awarded 0 points. Only one score for a correct answer is recorded per card, but scores for skipped and incorrect answers accumulate. The total score is always nonnegative. In Figure 4, "yes" answers were scored as 10 points, with no penalty for "no" or skipped cards. When viewing a stack with levels, only the cards from the current level are shown, but the score is cumulative for the entire stack.

You can also check your results for any particular card by choosing the "stat" option from the bottom of the screen while viewing that card. (See Figure 5.)

```
            Asymptote
          CARD 2 OF 3

NO:        2        SCORE:
YES:       1        0 OF 1
SKIP:      0


       PRESS ANY KEY...
```

Figure 5: Results for one card.

How do I create StudyCards™?

Use StudyCards™ Creator to create stacks of StudyCards™. This software is on the TI Resource CD, and can be downloaded from the TI web site ([1]).

Choose the type of stack you wish to create from the "New Stack" menu. This dialog box opens automatically when you open StudyCards™ Creator. There are four types of stacks: self-study, self-study with levels, multiple choice, and multiple choice with levels. The templates for the various types of stacks are all subsets of the template for multiple choice with levels. (See Figure 6.)

```
TIStudyCards - [FACTORIN.8xv]

File   Edit   View   Tools   Actions   Window   Help

Stack Type:     Multiple-Choice with Levels (TI-83 Plus / Silver Edition)      Right (+)  Wrong (-)  Skip (-)

Stack Title:    Factoring                    Score Values (0 - 100):   4      1      0

Version No:     1.0                          Create Date:     6/10/2003

Created By:     Barbara D'Ambrosia           Number of levels:   3


Card:   6   of   7                    Name of Card:   Card 6

1:  Card 1
2:  Card 2                            Front of Card        Screen 1 of 1    Back of Card         Screen 1 of 1
3:  Card 3                            Factor: x^2 - 12x + 36
4:  Card 4
5:  Card 5                            1. (x-18)(x-2)                        x^2 - 12x + 36
6:  Card 6                            2. (x-12)(x-3)                          = (x-6)(x-6)
7:  Card 7                            3. (x-9)(x-4)
                                      4. (x-6)(x-6)

                                      MENU CHOICE:? FLIP STAT        MENU CHOICE:X FLIP STAT

                                      Number of choices:    4        Level of Difficulty:
                                      The correct answer is:  4          2

Stack Size
For Help, press F1                                                                    NUM
```
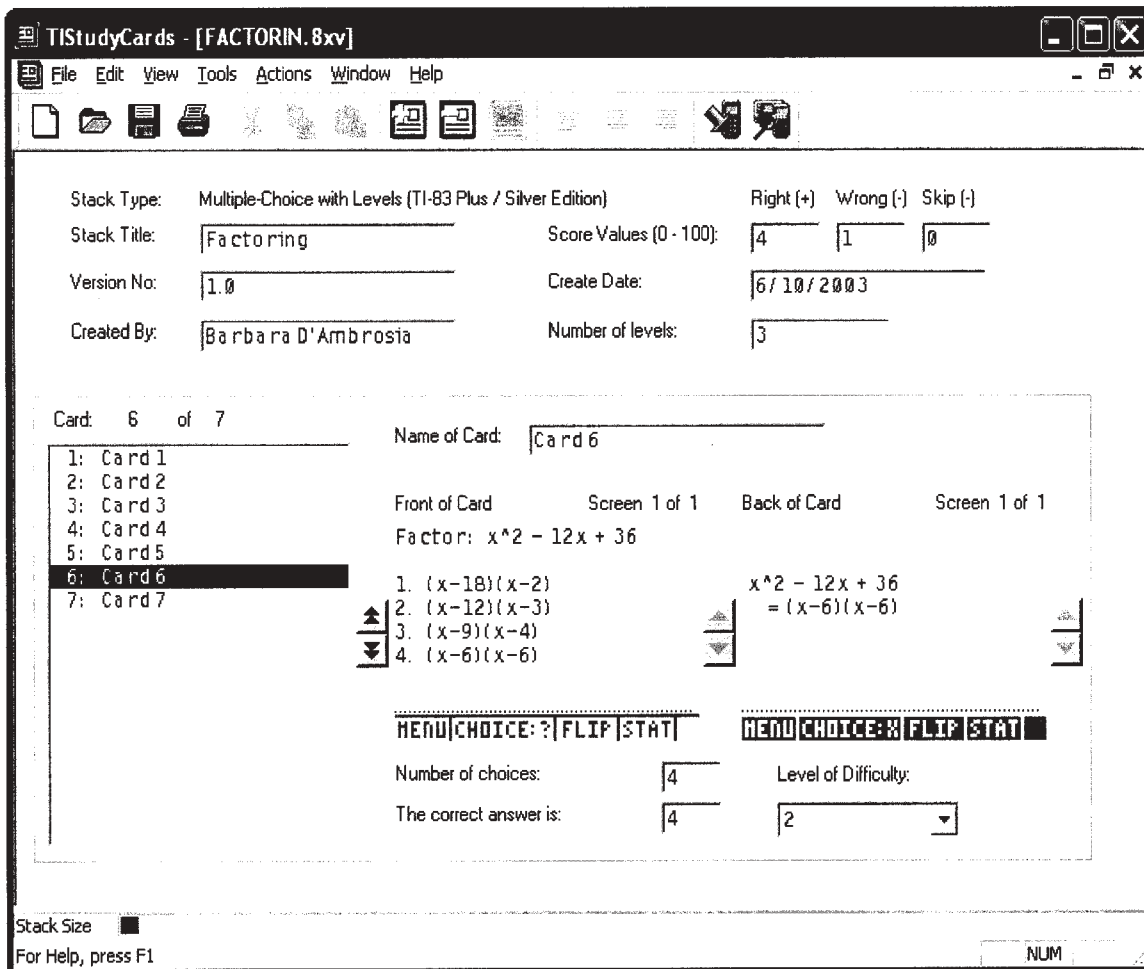
Figure 6: Template for multiple choice cards with levels.

The Version Number, Created By, Score Values, Create Date, and Name of Card are optional fields. Type the information for the front and back of the selected card in the appropriate box. You can copy and paste graphics from other applications (like a TI screen shot or a MathType equation) into these spaces by using the Edit ... Paste command. You are not required to type anything on the back of the card, but we normally choose to use that space to give and explain the correct answer. In order to save a stack of cards with levels, you must have created at least one card at each level.

Although cards containing graphics usually consume more memory than cards containing only text, there are times when only a graphic image can be faithful to mathematical notation. We have had good success using MathType to create cards containing mathematical symbols. If you wish to create your own graphic images, limit the size to 95×55 pixels, so the image will fit on the calculator screen. You can include images stored as bitmap (.bmp) files by selecting "insert image" from the Edit menu. From the dialog box, you have the option of cropping or shrinking overlarge images. You can also

paste graphics onto a card directly from the clipboard, in which case images that are too large will be shrunk.

For each multiple choice card, you must indicate the number of choices and the correct answer. These may vary from card to card within a stack. You should label the answer choices with numbers (1, 2, 3) instead of with letters (A, B, C), because students will select their answers using the number keypad of the calculator.

To create a new card in the stack, select "New Card" from the Actions menu. Right-clicking on a selected card in the card list brings up a menu through which you can create a new card or delete the current card. This menu also gives you the option of moving the card up or down in the stack. These functions are also available from toolbar buttons.

You can also create the text for a stack of StudyCards^{TM} by using an application that supports tables, like Microsoft Excel. Type the front of the cards in the first column of the table, and the backs of the cards in the second column. Copy the entire table to the clipboard. In StudyCards^{TM} Creator, right click in the card list and select "Paste Card." See the Help menu under "Creating Stacks Without StudyCards" for more information.

How Can I Use StudyCards^{TM} in My Classes?

Since the calculator does not store the results of a study session, it is difficult to judge whether students have used a particular stack of cards, or how well they've mastered the material on those cards. The best use of StudyCards^{TM}, therefore, is as an optional component of a course. You might create a stack of cards bearing the statements of definitions and theorems that students can use when studying for an exam, or you might create a stack of cards that students can use for drill on specific skills (like factoring). You can also have students create their own stacks of StudyCards^{TM}. This might be an especially good activity for students in a pre-service teaching methods course.

We conclude by offering a word of warning about academic honesty. Students have easy access to StudyCards^{TM} Creator, and they can use it to create cards for the purpose of storing notes in their calculators. If your students aren't allowed to use their textbooks or notes on an exam, they shouldn't be allowed to have StudyCard^{TM} stacks on their calculators during that exam, either.

References

[1] *Handheld Software Applications (Apps) for the TI-83 Plus Silver Edition and TI-83 Plus.* http://education.ti.com/us/product/tech/83pse/apps/appslist.html

[2] *TI-73/TI-83 Plus StudyCards^{TM} Viewer.*
http://education.ti.com/downloads/guidebooks/eng/ti73_83pstudycardsviewer.pdf