

Activity 5

CDs Anyone?



Teacher Notes

Concept

- ◆ Function rules
- ◆ Comparing values in tables and graphs

Skill

- ◆ Writing rules for real world functions
- ◆ Making a table to compare function values, using $\boxed{OP_1}$, $\boxed{OP_2}$, and $[K]$ keys, when appropriate
- ◆ Graphing linear functions on the coordinate plane

Applicable Calculator Functions

- ◆ $[\rightarrow OP_1]$, $\boxed{OP_1}$, $[\rightarrow OP_2]$, $\boxed{OP_2}$, $\boxed{STO\rightarrow}$, $[RCL]$

Materials

- ◆ Student Activity Sheets (page 40)
- ◆ Straight edge; colored pencils, markers or crayons
- ◆ TI-30X IIS/TI-34 II calculator

Objective

- ◆ Students will compare the price of two plans for buying compact disks, using advertisements, a table, and a graph.

Prerequisites

Prior to this activity, students should have some experience writing function rules and graphing on the coordinate plane. It will be helpful if they are familiar with the $\boxed{OP_1}$ and $\boxed{OP_2}$ keys (or $[K]$ on the TI-30X IIS).

Problem

Compare the cost of CDs ordered through the two advertisements below to find which company has the better plan.

Discount CDs Rock bottom prices! Each CD \$7.95 with \$4 shipping and handling fee for each order.

CDs-4-U \$6.95 per CD With \$8.95 service charge per order and no shipping fee.
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Activity

Have students work in pairs to write the function rule for each company's plan. Verify the rules through class discussion before students build the table or graph. (Students may have slightly different ways of writing the rule; for example, $\$7.95$ of CDs + $\$4.00$ vs $4 + 7.95x$ for DCD). It is important that students realize that all correct forms of the rule are equivalent. Often you can use properties to show them how the rules are equivalent. Another way to do this is to let students complete the table of values for each form of the rule and then compare to see that those values are the same.

When students have completed all of the activity except the final paragraph, lead a class discussion about their findings and conclusions. They should realize that it is cheaper to order from DCD if they want to order one through four CDs and from CDs-4-U if they want to purchase 5 or more CDs; thus, each plan is better under certain conditions.

Most students will realize that the advertisements do not provide enough information to make a good comparison. Some will probably prefer a table, others, a graph, for comparing the plans. It should be stressed that this is a matter of personal preference, that one representation is not better than the other in most cases.

A valuable topic for discussion is whether the coordinates on the graph should be connected. Students at these grade levels often have dealt only with graphs for which the coordinates have been connected. This activity provides a nice context for introducing discrete versus continuous graphs. Students can easily conclude that the values between the coordinates for this situation have no meaning since you can purchase only a whole number of CDs; therefore, this graph is discrete. Solicit from students examples of situations for which joining the coordinates for the graph of such an activity with line segments would be appropriate and explain that the graphs are called continuous.

Wrap-Up

Have students write the final paragraph about what they learned in this activity. You may choose to have some students read their paragraphs aloud or you can choose portions to share the next day in class.

Assessment

The class discussion and completed paragraphs can serve as an assessment tool. It is also appropriate to give a similar follow-up problem for students to solve individually.

Example:

Moi Bank charges $\$1.75$ per month plus $\$.08$ per check. Bank Uno charges $\$2.50$ per month plus $\$.06$ per check. At which bank is a checking account a better deal?

Extensions

- ◆ Have students work in pairs or groups to gather data from the Internet and/or advertisements to make up a problem similar to this one. Caution them to try to find plans for which it is not immediately obvious that one is always better than the other or restrict them from using two such plans. Have pairs or groups present their problems to the rest of the class. If time permits, have the other students work the problem before the problem posers present their solution.
- ◆ Add a third CD Purchase Plan and have students add to their table and graph and re-write their conclusions.

Example:

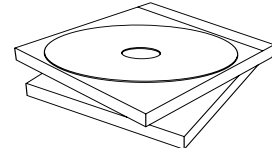
Best Buy CDs (BBC) offers a one-time \$35 membership fee and each CD costs \$5.00.



Name _____

Date _____

Activity 5



CDs Anyone?

Objective: You will compare the price of two plans for buying compact disks, using advertisements, a table, and a graph.

Problem: Compare the cost of CDs ordered through the two advertisements below to find which company has the better plan.

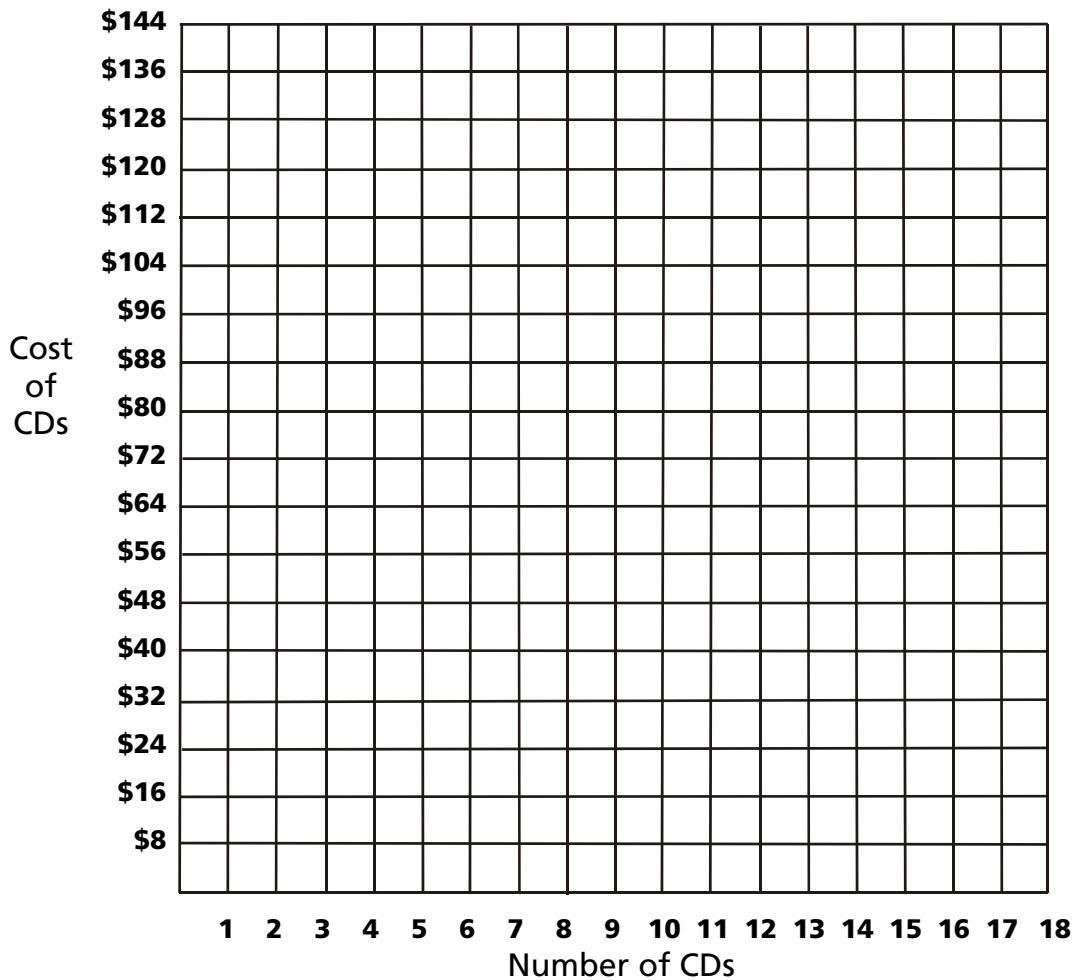
<p>Discount CDs</p> <p>Rock bottom prices!</p> <p>Each CD \$7.95 with \$4 shipping and handling fee for each order.</p>

<p>CDs-4-U</p> <p>\$6.95 per CD</p> <p>With \$8.95 service charge per order and no shipping fee.</p>
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- Complete the table below to show the cost of 1 through 15 CDs for each plan.

# of CDs	Discount CDs	CDs 4-U
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

2. Graph the cost of purchasing the CDs through each plan below.



3. How much would five CDs cost from Discount CDs? _____
From CDs-4 U? _____
4. How much would ten CDs cost from Discount CDs? _____
From CDs-4-U? _____
5. Which company has the best plan? Explain your reasoning.

6. Which representation — the advertisements, the table, or the graph — helps you most in deciding which plan is best? Explain your reasoning.
7. Write a paragraph about what you learned in this activity.

CDs Anyone? Keystrokes for the TI-34 II

Example: 4 + 7.95 X for Discount CDs.

PRESS	DISPLAY
$\boxed{2\text{nd}} \boxed{[\triangleright\text{OP}_1]}$	OP1 = (Press $\boxed{\text{CLEAR}}$ if needed)
$\boxed{+} \boxed{7} \boxed{\cdot} \boxed{9} \boxed{5} \boxed{\text{ENTER}}$	OP1 = + 7.95
$\boxed{4} \boxed{[\text{OP}_1]}$	4 + 7.95 1 11.95
$\boxed{[\text{OP}_1]}$	11.95 + 7.95 2 19.90
$\boxed{[\text{OP}_1]}$	19.9 + 7.95 3 27.85

Example: 8.95 + 6.95 X for CDs-4-U.

PRESS	DISPLAY
$\boxed{2\text{nd}} \boxed{[\triangleright\text{OP}_2]}$	OP2 = (Press $\boxed{\text{CLEAR}}$ if needed)
$\boxed{+} \boxed{6} \boxed{\cdot} \boxed{9} \boxed{5} \boxed{\text{ENTER}}$	OP2 = + 6.95
$\boxed{8} \boxed{\cdot} \boxed{9} \boxed{5} \boxed{[\text{OP}_2]}$	8.95 + 6.95 1 15.9
$\boxed{[\text{OP}_2]}$	15.9 + 6.95 2 22.85
$\boxed{[\text{OP}_2]}$	22.85 + 6.95 3 29.8

CDs Anyone? Keystrokes for the TI-30X IIS

Example: $4 + 7.95 X$ for Discount CDs.

PRESS	DISPLAY
$\boxed{2nd} \boxed{[K]}$	K = (Press \boxed{CLEAR} if needed)
$\boxed{+} \boxed{7} \boxed{\cdot} \boxed{9} \boxed{5} \boxed{ENTER}$	K = +7.95 DEG K
$\boxed{4} \boxed{ENTER}$	4 + 7.95 11.95 DEG K
\boxed{ENTER}	Ans + 7.95 19.9 DEG K
\boxed{ENTER}	Ans + 7.95 27.85 DEG K

Example: $8.95 + 6.95 X$ for CDs 4-U.

PRESS	DISPLAY
$\boxed{2nd} \boxed{[K]}$	K = (Press \boxed{CLEAR} if needed)
$\boxed{+} \boxed{6} \boxed{\cdot} \boxed{9} \boxed{5} \boxed{ENTER}$	K = + 6.95 DEG K

PRESS	DISPLAY
8 \square 9 5 \square	+ 6.95 15.9 DEG K
\square	Ans + 6.95 22.85 DEG K
\square	Ans + 6.95 29.8 DEG K

Note: You must clear the constant [K] key when you are finished.

