

## Using Coordinates to Find Area With the *fx-7400G PLUS* A Pre-Algebra Activity

After working with the formulas for area, students can use the following program to find the area of irregular figures. The program will determine the area of any convex polygon. Have them enter the program using the following keystrokes. Explain to your students that they will study determinants in their algebra courses and that this program is making use of determinants to find the area of a polygon.

Keystrokes:

SETUP, %, %, %, %, F2, EXE  
 PRGM, %, F3, F3, EXE  
 SETUP, %, %, %, %, F3, EXE  
 PRGM, %, F3, F3, EXE

```

= AREA =
VarList1
ClrList
VarList2
ClrList
TOP BTM MENU
  
```

0, →, ALPHA, D, EXE  
 0, →, ALPHA, U, EXE  
 0, →, ALPHA, X, EXE  
 QUIT, %, F2, ALPHA, N, SHIFT, =, %, F2, PRGM, %, F1, →, ALPHA, N, EXE

```

= AREA =
0→D
0→U
0→X
"N=" ?→N
TOP BTM MENU
  
```

QUIT, %, F2, ALOCK, I, N, P, U, T, SPACE, X, %, F1, S, Space, SHIFT, {, □  
 SHIFT, }, Quit, %, F2, PRGM, %, F1, →, OPTN, F1, F1, 1, EXE  
 %, F2, ALOCK, I, N, P, U, T, SPACE, Y, %, F1, S, Space, SHIFT, {, □  
 SHIFT, }, %, F2, PRGM, %, F1, →, OPTN, F1, F1, 2, EXE

```

= AREA =
"INPUT X'S (,
)" ?→List 1
"INPUT Y'S (,
)" ?→List 2
TOP BTM MENU
  
```

PRGM, F1, %, F1, 1, →, ALPHA, X, PRGM, F1, %, F2, ALPHA, N, EXE  
 OPTN, F1, F1, 1, SHIFT, [, ALPHA, X, SHIFT, ], \*, OPTN, F1, F1,  
 2, SHIFT, [, ALPHA, X, +, 1, SHIFT, ], +, ALPHA, D, →, ALPHA, D, EXE  
 OPTN, F1, F1, 2, SHIFT, [, ALPHA, X, SHIFT, ], \*, OPTN, F1, F1,

```

= AREA =
For 1→X To N
List 1[X]×Lis
t 2[X+1]+D→D
List 2[X]×Lis
TOP BTM MENU
  
```

1, SHIFT, [, ALPHA, X, +, 1, SHIFT, ], +, ALPHA, U, →, ALPHA, U, EXE  
 PRGM, F1, %, F4, EXE  
 (, ALPHA, D, -, ALPHA, U, ), /, 2, →, ALPHA, A, EXE  
 QUIT, %, F2, ALOCK, A, R, E, A, SHIFT, =, F2, PRGM, %, %, F3, ALPHA, A,  
 PRGM, %, F2

```

= AREA =
t 1[X+1]+U→U
Next
(D-U)÷2→A
"AREA=" :A
TOP BTM MENU
  
```

In the program files, AREA will look like this.

```
Filename:AREA
VarList1↵
ClrList↵
VarList2↵
ClrList↵
0→D↵
0→U↵
0→X↵
"N="?"→N↵
"INPUT X'S {,}"?"→List 1↵
"INPUT Y'S {,}"?"→List 2↵
For 1→X To N↵
List 1[X]*List 2[X+1]+D→D↵
List 2[X]*List 1[X+1]+U→U↵
Next↵
(D-U)/2→A↵
"AREA=":A:
Stop
```

Have students list the coordinates of the vertices in order. For example, to find the area of the triangle with vertices at (1,2), (6,2), and (3,4):

Respond to the first prompt that n (number of vertices) = 3, since there are three vertices in the polygon. Input the x's in brackets, listing the x's **counterclockwise in order and repeating the first one last**.

```
N=?
3
INPUT X'S (, )
1?
(1,6,3,1)
```

Input the y-values in the same manner. The area of the triangle will be displayed in square units.

```
1?
(1,6,3,1)
INPUT Y'S (, )
?
(2,2,4,2)
```

```
?
(2,2,4,2)
AREA=
- DISP - 5
```