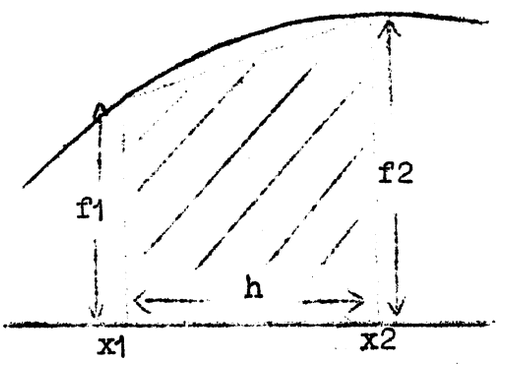
```
begin
comment to order lists of positive integers
integer p
1: read(p)
if p<0 then stop

      begin
      integer i,j
      integer array A(1:p)
      integer fn spec MAX(integer array name V, integer k)
      routine spec interchange (integer name a,b)
      cycle i = 1,1,p
      read (A(i))
      repeat
      -> 2 if p = 1
      cycle i = p,-1,2
      j = MAX(A,i)
      interchange (A(j), A(i))
      repeat
   2: cycle i = 1,1,p
      newline ; print (A(i),5,0)
      repeat

      integer fn  MAX(integer array name V, integer k)
      integer p,q,r
      r = 0
      cycle p = 1,1,k
      if r ≥ V(p) then -> 1
      r = V(p) ; q = p
   1: repeat
      result = q
      end

      routine interchange (integer name a,b)
      integer z
      z=a ; a=b ; b=z
      end

      end ; comment end of inner block
newline ; newline ; -> 1

end of program
```

ROUTINES AND FUNCTIONS AS PARAMETERS

It is possible to include routines and functions among the formal parameters of a routine or function by means of the type statements *routine*, *real fn*, and *integer fn*. When calling the routine or function the actual parameters must be the names of routines or functions declared either at the head of the block in which the call is made or in any exterior block. Note, however, that all quantities, other than the formal parameters, used in a routine or function description must be global to this description. It is not sufficient for them to be global at the time of call.

Example



Calculate approximately the area under the graph of y=f(x) between x = x1 and x = x2 using the trapezoidal rule. This is illustrated in the accompanying diagram. The area of the shaded part of the panel is $h(\frac{f2 + f1}{2})$. The calculation is performed by dividing the area under the graph into a number of such panels, applying the formula to each panel and summing the results.

The program opposite carries out the approximate calculation five times, with the area divided into, 10, 20 30, 40 and 50 panels. The curve used is a quarter circle given by $y = \sqrt{1-x^2}$, from x = 0 to x = 1. The exact area is $\pi/4 = 0.785398163$.