Example. Calculate the arc sine of .5 and —.5.

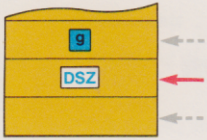
Press	See Displayed	
.5	.5	
B	30.00	(degrees)
.5 CHS	–.5	
B	330.00	(degrees)

Decrement and Skip on Zero

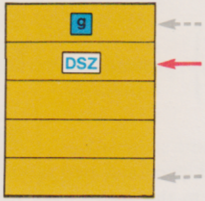
The DSZ (*decrement and skip on zero*) key subtracts 1 from the contents of R_8 and then tests for a non-zero value. The conditional can be stated like this:

Is the value in R_8 a number other than zero?

Once again, if the condition is met, program execution continues sequentially. If the condition is not met and the value in R_8 is zero after 1 has been subtracted, the program pointer skips two steps.



Condition Met.
If the value in $R_8 \neq 0$
continue execution sequentially.



Condition Not Met.
If the value in $R_8 = 0$ skip two
steps before continuing execution.

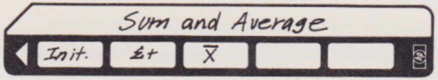
Continue here.

Naturally, since R_8 is used by DSZ, you will not want to use this register for other storage purposes when this test is a part of your program. DSZ does not work if the number stored in R_8 falls outside the range $-10^{10} = r_8 = 10^{10}$ and (*in general*) is not designed to work for non-integer values less than one.

DSZ can be used in many ways in your programs. It can be used as a counter, as a flag (*see page 91*) to repeat segments of your program, or to repeat your whole program.

Writing a Program Using DSZ. To use DSZ as a counter in your program, store zero in R_8 and include DSZ in the section of your program that repeats. As your program runs, R_8 keeps track of the number of repetitions (*although the number is negative*).

The following programs sum and average a group of numbers using DSZ in this way. The key art will give you a good idea as to how these programs work.



Switch to W/PRGM mode, press f PRGM, and key in these programs now.

Keys	Comments	Keys	Comments
LBL A	Beginning of initialization program.	g DSZ	And the value in R_8 decreases by 1 each time.
f REG	Clears all registers.	RCL 1	Display running total.
RTN		RTN	
LBL B	Beginning of program that sums the data.	LBL C	Beginning of program that averages.
STO + 1	Each number is accumulated in R_1.	RCL 1 RCL 8 CHS ÷	Total is divided by the positive value of the number of repetitions.
		RTN	