Appendix 5: Program to Calculate the P-Value for a Hypothesis Test of Standard Deviation

The following program can be used to calculate the P-Value for a hypothesis for a standard deviation or variance.

```plaintext
PROGRAM: TESTSDEV
: ClrHome
: Disp "ENTER N"
: Input N
: Disp "ENTER S"
: Input S
: Disp "ENTER x"
: Output(5, 8, "")
: Input X
: Disp "ENTER TAIL(S)"
: Disp "1-LEFT"
: Disp "2-TWO"
: Disp "3-RIGHT"
: Input T
: N-1 ↑ D
: D*S^2/X^2 ↑ C
: ClrHome
: Disp "TEST STAT=
: Disp C
: If T=1 pellets PRGM, CLR, 1:If
: χ²cdf(0, C, D) ↑ P
: If T=3
: χ²cdf(C, 1e99, D) ↑ P
: If T=2
: Then pellets PRGM, CLR, 2:Then
: χ²cdf(C, 1e99, D) ↑ P
: If P>.5
: 1-P ↑ P
: 2*P ↑ P
: End
: Disp "P-VALUE ="
: Disp P
```

Note: The $\chi^2$ distribution can be entered by pressing the 2nd key and DISTR 7: $\chi^2$ cdf . There are three arguments needed for the chi-square cdf function. You need the low bound, high bound, and degrees of freedom.

$\chi^2$ cdf(Low, High, df).