Title Page	1.1
Product quality is usually monitored using statistical control charts. Measurements on a process variable to be monitored change over time. Here we will attempt to check for shifts in the process variable that might indicate control problems.	1.1 2.1 3.1 4.1 RAD_AUTO_REAL Drawing a Control Chart Paul Koestler AP Statistics Lafayette HS Buffalo, New York pkoestler@buffaloschools.org
New Page	2.1
a) Input the data into a list.	1.1 2.1 2.2 3.1 RAD AUTO REAL Once a process is in control and is producing a satisfactory product, the process variables are monitored with control charts. A A A C 4 9 119.96 1 19.96 1 10 10.03 10 5 10 120.05 A
New Page	2.2
a) Using 1-Var Stats with the diameter list to find our grand mean.	2.1 2.2 2.3 3.1 RAD AUTO REAL A d B dia C D • =OneVar(1 6 119.96 Title One-Varia 2 7 120.04 X 11 3 8 120.03 $\Sigma \times$ 11 4 9 119.94 $\Sigma \times^2$ 1291 5 10 120.05 sx := $s_{n-1} \times$.03 A7 6

New Page	2.3
	4 2.1 2.2 2.3 3.1 ▶RAD AUTO REAL ☐
a) We now have our mean and our centerline data.	We will construct a control chart for
	n = 9 daily average diameters (mm) of
	CD's being manufactured on a particular
	machine. The size of each sample was
	k = 5 CD's. The sample deviation is
	s = 0.4 for all 45 (D's (9*5)
	Shown is the data
	Using lists, find the grand mean of
	osing lists, find the grand mean of
	Tait 9 days (centertine), dsing 1-var stats.
New Page	3.1
a) Setting up the calculator to	
graph our scatterplot.	for all 45 CD a so we depend on the fact
	that $s = 0.4$ is given. Our actual standard
	deviation worked out to be $s = 0.287$ for
	the 9 CD's
	We have to set up the LICL (upper control
	limit). I CL (lower control limit), and the
	centerline in Y=.
	We have to store UCL, LCL, and Centerline
	· · · · · · · · · · · · · · · · · · ·
New Page	3.2
	▲ 2.3 3.1 3.2 4.1 RAD AUTO REAL
a) Here we have found our	120+ 3.0387 120.052
UCL, LCL, and centernine.	√5
b) Using the sto function we	120_3.0387 119.948
can store our functions in Y=	$\frac{120}{\sqrt{5}}$
and begin to graph our plot.	$120.052 \rightarrow y$ 120.052
	<u>119.948→1</u> 119.948
	<i>v3</i> =120 true
	5/5

New Page a) Our scatter plot will help indicate if our control process was in control or not.	4.1 2.3 3.1 3.2 4.1 RAD AUTO REAL $f_2(x)=120.052$ (days,diameter) $f_3(x)=120$ $f_3(x)=120$ $f_3(x)=120$
New Page a) Based on our findings, it is safe to say that our variability of the diameter was unacceptably high on one occasion.	4.2 4.2 3.1 3.2 4.1 4.2 RAD AUTO REAL Setting up our scatterplot, allowed us to view the UCL, LCL, and Constant Functions. It appears that the process was "definitely out of control" one time, and "borderline out of control" once also. The variability of the diameter of the CD's is unacceptably high on at least one occasion.