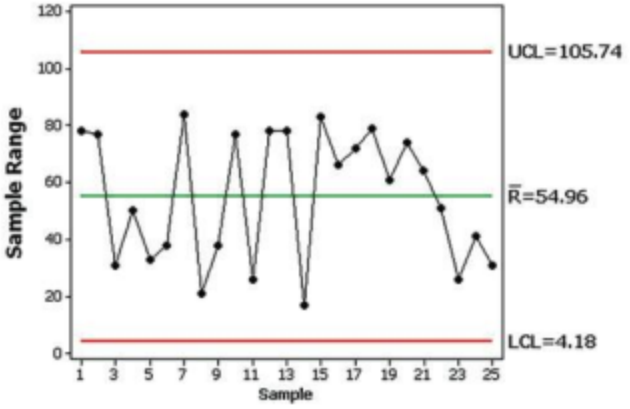
5. 13.8 hours $< \mu <$ 15.3 hours. We have 95% confidence that the limits of 13.8 hours and 15.3 hours contain the true value of the population mean.
6. $r = 0.205$. Critical values: $r = \pm 0.811$. P-value $= 0.697$. There is not sufficient evidence to support the claim of a linear correlation between price and quality score. It appears that you don't get better quality by paying more.
7. $r_s = -0.543$. Critical values: ± 0.886. Fail to reject the null hypothesis of $\rho_s = 0$. There is not sufficient evidence to support the claim that there is a correlation between price and rank.
8. $0.276 < p < 0.343$. Because the value of 0.25 is not included in the range of values in the confidence interval, the result suggests that the percentage of all such telephones that are not functioning is different from 25%.
9. 1692 (Tech: 1691)
10. There must be an error, because the rates of 13.7% and 10.6% are not possible with samples of size 100.

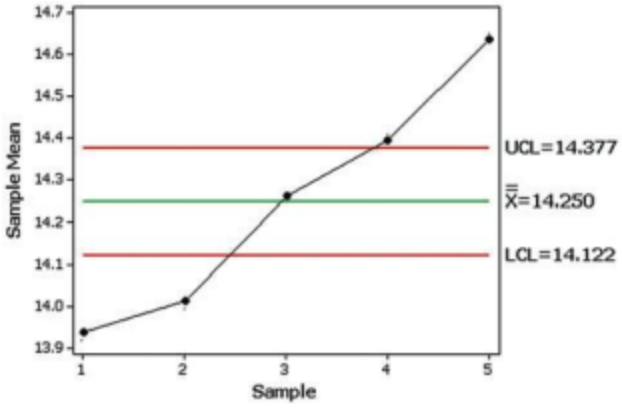
Chapter 14

Section 14-2

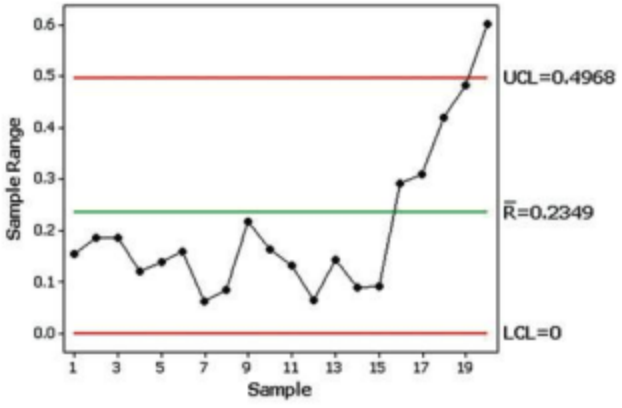
1. No. If we know that the manufacture of quarters is within statistical control, we know that the three out-of-control criteria are not violated, but we know nothing about whether the *specification* of 5.670 g is being met. It is possible to be within statistical control by manufacturing quarters with weights that are very far from the desired target of 5.670 g.
3. To use an $\bar{x}$ chart without an R chart is to ignore variation, and amounts of variation that are too large will result in too many defective goods or services, even though the mean might appear to be acceptable. To use an R chart without an $\bar{x}$ chart is to ignore the central tendency, so the goods or services might not vary much, but the process could be drifting so that daily process data do not vary much, but the daily means are steadily increasing or decreasing.
5. $\bar{\bar{x}} = 267.11$ lb, $\bar{R} = 54.96$ lb. For R chart: LCL $= 4.18$ lb and UCL $= 105.74$ lb. For $\bar{x}$ chart: LCL $= 244.08$ lb and UCL $= 290.14$ lb.
7. The R chart does not violate any of the out-of-control criteria, so the variation of the process appears to be within statistical control.



9. $\bar{\bar{x}} = 14.250°C$, $\bar{R} = 0.414°C$. For R chart: LCL $= 0.092°C$ and UCL $= 0.736°C$. For $\bar{x}$ chart: LCL $= 14.122°C$ and UCL $= 14.377°C$.
11. Because there is a pattern of an upward trend and there are points lying beyond the control limits, the $\bar{x}$ chart shows that the process is out of statistical control.



13. The R chart and the s chart are very similar.



Section 14-3

1. No, the process does not appear to be within statistical control. There is a downward trend, there are at least 8 consecutive points all lying above the centerline, and there are at least 8 consecutive points all lying below the centerline. Because the proportions of defects are decreasing, the manufacturing process is not deteriorating; it is improving.
3. LCL denotes the lower control limit. Because the value of -0.000025 is negative and the actual proportion of defects cannot be less than 0, we should replace that value by 0.
5. The process appears to be within statistical control.