11. Predicting Height If someone has a foot length of 29.0 cm, what is the single value that is the best predicted height?

12. Finding a Prediction Interval For someone with a foot length of 29.0 cm, identify the 95% prediction interval estimate of their height, and write a statement interpreting that interval.

Finding a Prediction Interval. *In Exercises 13–16, use the paired data consisting of foot lengths (cm) and heights (cm) of the 40 people listed in Data Set 2 of Appendix B. Let x represent foot length and let y represent the corresponding height. Use the given foot length and the given confidence level to construct a prediction interval estimate of height. (Hint: Use the results in the top half of the Minitab display that accompanies Exercises 9–12. Also, $\bar{x} = 25.68$ cm, $\Sigma x = 1027.2$ cm, and $\Sigma x^2 = 26{,}530.92$ cm².)*

13. Foot length: 25.0 cm; 95% confidence

14. Foot length: 25.0 cm; 99% confidence

15. Foot length: 22.0 cm; 90% confidence

16. Foot length: 26.0 cm; 95% confidence

Variation and Prediction Intervals. *In Exercises 17–20, find the (a) explained variation, (b) unexplained variation, and (c) indicated prediction interval. In each case, there is sufficient evidence to support a claim of a linear correlation, so it is reasonable to use the regression equation when making predictions.*

17. Altitude and Temperature Listed below are altitudes (thousands of feet) and outside air temperatures (°F) recorded by the author during Delta Flight 1053 from New Orleans to Atlanta. For the prediction interval, use a 95% confidence level with the altitude of 6327 ft (or 6.327 thousand feet).

Altitude	3	10	14	22	28	31	33
Temperature	57	37	24	−5	−30	−41	−54

18. Town Courts Listed below are amounts of court income and salaries paid to the town justices (based on data from the *Poughkeepsie Journal*). All amounts are in thousands of dollars, and all of the towns are in Dutchess County, New York. For the prediction interval, use a 99% confidence level with a court income of $800,000.

Court Income	65	404	1567	1131	272	252	111	154	32
Justice Salary	30	44	92	56	46	61	25	26	18

19. Galaxy Distances The table below lists measured amounts of redshift and the distances (billions of light-years) to randomly selected clusters of galaxies (based on data from *The Cosmic Perspective* by Bennett et al., Benjamin Cummings). For the prediction interval, use a 90% confidence level with a redshift of the cluster Hydra of 0.0126.

Redshift	0.0233	0.0539	0.0718	0.0395	0.0438	0.0103
Distance	0.32	0.75	1.00	0.55	0.61	0.14

20. Diamond Prices The table below lists weights (carats) and prices (dollars) of randomly selected diamonds. For the prediction interval, use a 95% confidence level with a diamond that weighs 0.8 carats.

Weight	0.3	0.4	0.5	0.5	1.0	0.7
Price	510	1151	1343	1410	5669	2277