Extending Concepts

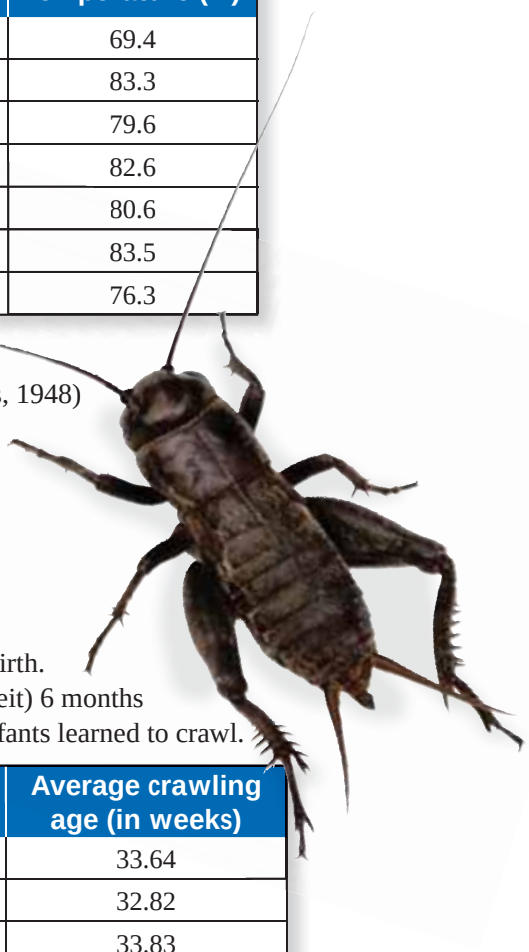
Linear Regression in Excel **In Exercises 19 and 20, use the information below.**

You can use Excel to find the best-fitting line for a data set. Enter the data into a spreadsheet. Make a scatter plot of the data. Click on the scatter plot. From the chart menu, choose "Add Trendline." Click on the "Options" tab. Check the box labeled "Display equation on chart." Click "OK." This will add the best-fitting line and its equation to your scatter plot.

19. The data set relates the number of chirps per second for striped ground crickets and the temperature in degrees Fahrenheit.

Chirps per second	Temperature (°F)
20.0	88.6
16.0	71.6
19.8	93.3
18.4	84.3
17.1	80.6
15.5	75.2
14.7	69.7
17.1	82.0

Chirps per second	Temperature (°F)
15.4	69.4
16.2	83.3
15.0	79.6
17.2	82.6
16.0	80.6
17.0	83.5
14.4	76.3



(*Source:* George W. Pierce, *The Song of Insects*, Harvard University Press, 1948)

a. Enter the data into a spreadsheet and make a scatter plot of the data.

b. Graph the best-fitting line on your scatter plot and find its equation.

c. Estimate the temperature when there are 19 chirps per second.

d. Estimate the temperature when there are 22 chirps per second.

20. Data were collected from a sample of 414 infants, grouped by month of birth. The data set relates the average monthly temperature (in degrees Fahrenheit) 6 months after the infants were born and the average age (in weeks) at which the infants learned to crawl.

Average temperature (°F)	Average crawling age (in weeks)
66	29.84
73	30.52
72	29.70
63	31.84
52	28.58
39	31.44

Average temperature (°F)	Average crawling age (in weeks)
33	33.64
30	32.82
33	33.83
37	33.35
48	33.38
57	32.32

(*Source:* Janette Benson, *Infant Behavior and Development*, 1993)

a. Enter the data into a spreadsheet and make a scatter plot of the data.

b. Graph the best-fitting line on your scatter plot and find its equation.

c. Estimate the average crawling age for infants when the average temperature 6 months after they are born is 55°F.

d. Estimate the average crawling age for infants when the average temperature 6 months after they are born is 475°F. Is this temperature reasonable? Is your estimate reasonable? Explain your reasoning.