Advanced Algebra

Linear Regression Calculator Worksheet 2.5

Name _____

Date _____ Period _____

Use your TI-nspire calculator to answer all questions below.

1. Anthropologists use a linear model that relates femur length to height. The model allows an anthropologist to determine the height of an individual when only a partial skeleton (including the femur) is found. In this problem we find the model by analyzing the data on femur length and height for the eight males given in the table.

   a) Find and graph a linear equation that models the data.

   y= _____

   b) An anthropologist finds a femur of length 58 cm. How tall was the person?

Femur length (cm)	Height (cm)
50.1	178.5
48.3	173.6
45.2	164.8
44.7	163.7
44.5	168.3
42.7	165.0
39.5	155.4
38.0	155.8

2. A convenience store manager notices that sales of soft drinks are higher on hotter days, so he assembles the data in a table, show below.

   a) Find and graph a linear equation that models the data.

   y= _____

   b) Use the equation to predict soft drink sales if the temperature is $95°F$.

High Temperature ($°F$)	Number of Cans Sold
55	340
58	335
64	410
68	460
70	450
75	610
80	735
84	780

3. To estimate ages of trees, forest rangers use a linear model that relates tree diameter to age. The model is useful because tree diameter is much easier to measure than tree age (which requires special tools for extracting a representative cross section of the tree and counting the rings). Use the data in the table below collected for a certain variety of oaks to answer the following questions.

   a) Find and graph a linear equation that models the data.

   y= _____

   b) Use the equation to estimate the age of an oak whose diameter is 18 in.

Diameter (in.)	Age (years)
2.5	15
4.0	24
6.0	32
8.0	56
9.0	49
9.5	76
12.5	90
15.5	89

4. Biologists have observed that the chirping rate of crickets of a certain species appears to be related to temperature. The table shows the chirping rates for various temperatures.
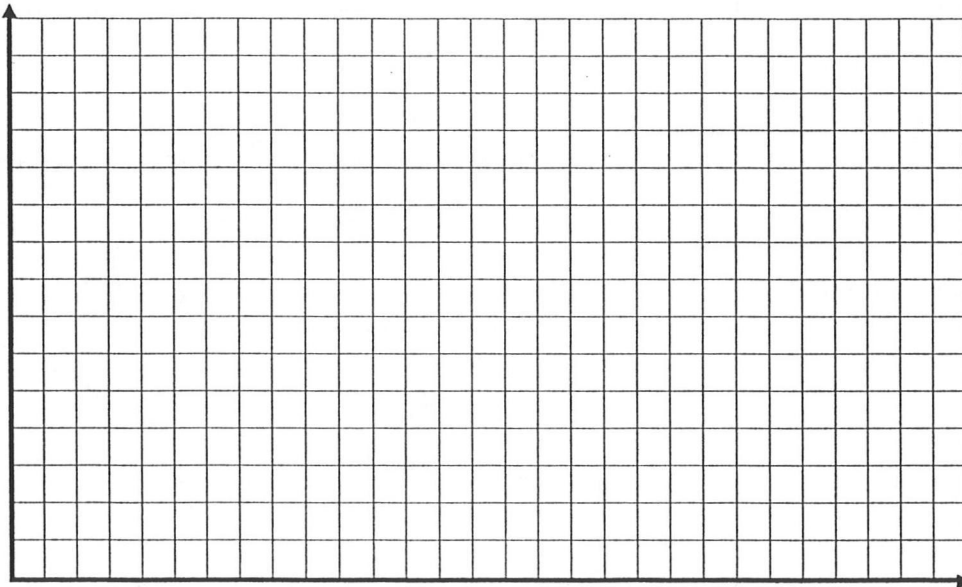
   a) Find and graph the regression line.

      y= _____

   b) Use the linear regression to estimate the chirping rate at 100°F

Temperature (°F)	Chirping Rate (chirps/min)
50	20
55	46
60	79
65	91
70	113
75	140
80	173
85	198
90	211

5. Jocelyn is analyzing the sales of her company. The table below shows the total sales for each of six years.

   a) Make a scatter plot of the data BY HAND.

Year	Sales (5 millions)
2003	31.2
2004	34.6
2005	28.9
2006	37.7
2007	41.3
2008	45.1

   b) Find a regression equation and then use the equation to predict the sales in 2015.