

1

In BMX dirt-bike racing, jumping high or "getting air" depends on many factors: the rider's skill, the angle of the jump, and the weight of the bike. Here are data about the maximum height for various bike weights.

Weight (pounds)	19	19.5	20	20.5	21	22	22.5	23	23.5	24
Height (inches)	10.35	10.3	10.25	10.2	10.1	9.85	9.8	9.79	9.7	9.6

- Plot the data on the graph below. Be sure to label the graph.
- Find the line of best fit.
- What do the rate of change and y-intercept tell you about this situation?
- Using your equation or your graph, predict the maximum height for a bike that weighs 18 lbs.
- Using your equation or your graph, predict the weight of a bike that jumped 10 inches.

Linear Regression Models

2

The giant panda is an endangered animal that primarily lives in China. A grown male panda can weigh up to 350 pounds. The weight of a panda bear was recorded when it was born.

Age (months)	1	2	3	4	6	8	10	12
Weight (in pounds)	2.5	7.6	12.5	17.1	24.3	37.9	49.2	54.9

- Find a linear model that best fits the data.
- Predict the weight of the panda that is:
 - 15 months old:
 - 20 months old:
 - 24 months old:
- Predict the age of the panda that weighs:
 - 100 lbs:
 - 150 lbs:
 - 200 lbs:

3. Sally and her friends left for a road trip during spring break. They recorded how many miles they drove after each hour.

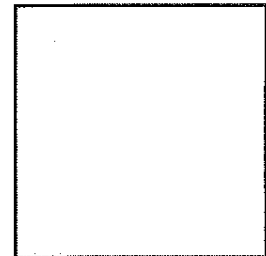
Hours Driven	1	2	3	4	5	6	7	8	9	10
Distance Travelled (miles)	55	108	168	238	323	385	452	524	607	698

- a. Find the linear model that best describes the data.
- b. Predict the distance traveled if Sally has been driving:
- i. 6 hours:
 - ii. 11 hours:
 - iii. 15 hours:
- c. Predict the number of hours driven if the distance traveled:
- i. 1600 miles:
 - ii. 250 miles:
 - iii. 600 miles:

4. The table below shows the concentration of ozone in Earth's atmosphere at different altitudes. Write the exponential regression equation that models these data, rounding *all* values to the *nearest thousandth*.

Concentration of Ozone

Altitude (x)	Ozone Units (y)
0	0.7
5	0.6
10	1.1
15	3.0
20	4.9



5. A box containing 1,000 coins is shaken, and the coins are emptied onto a table. Only the coins that land heads up are returned to the box, and then the process is repeated. The accompanying table shows the number of trials and the number of coins returned to the box after each trial.

Trial	0	1	3	4	6
Coins Returned	1,000	610	220	132	45

- Write an exponential regression equation, rounding the calculated values to the *nearest ten-thousandth*.
Use the equation to predict how many coins would be returned to the box after the eighth trial.