

Former Test Question

13. The table shows the temperature of various altitudes when climbing Mt. Mitchell.

a.) Find an equation for this line.

$$y = -3.6x + 63.5$$

b.) What is the correlation coefficient? What does it mean?

$r = -0.99$ Strong negative correlation (close to a line w/ negative slope)

c.) What would be the temperature if the altitude was 15,000 ft?

$$y = -3.6x + 63.5$$

$$y = -3.6(15) + 63.5$$

$$y = 9.5^\circ\text{F}$$

d.) How high up would you be if the temperature was 12°F ?

$$y = -3.6x + 63.5$$

$$12 = -3.6x + 63.5$$

$$-63.5 = -3.6x - 63.5$$

$$-51.5 = -3.6x$$

$$x = 14.3$$

e.) What does the slope mean in context?

$m = -3.6 = \frac{\Delta y}{\Delta x}$ Temperature decreases by 3.6°F for every 1000ft in altitude.

f.) What does the y-intercept mean in context?

$(0, 63.5)$
 alt. temp.

Temperature was 63.5°F at 0 ft (at bottom)

Altitude (in 1,000 of feet)	Temperature (in $^\circ\text{F}$)
34.6	-58
27.300	-35
29.500	-14
13.000	13
9.5	27
6.6	39
4.3	49
2.1	57
0.6	63
0.1	65

L_1 X
 L_2 Y

Diamond Carat Weight. Diamond carat weight is the measurement of how much a diamond weighs. A metric "carat" is defined as 200 milligrams. Each carat can be subdivided into 100 'points.' This allows very precise measurements to the hundredth decimal place.

What is Diamond Carat | The 4Cs of Diamond Quality by GIA

<https://4cs.gia.edu/EN-US/diamond-carat-weight.htm>



4) Consider the following data.

Carats	0.17	0.18	0.25	0.19	0.21	0.28	0.2	0.23	0.16
Cost	355	325	642	485	483	823	498	595	336

Graph & label axes

- 1) Write a linear equation to model the data.
- 2) Describe the correlation.
- 3) What does the slope represent in this situation?
- 4) What does the y-intercept of the line represent in this situation?
- 5) Using your model, how much would a 0.75 carat diamond cost?
- 6) Using your model, what size carat can you buy for \$1,000?