

Algebra 1

4.6

Write equations of best-fit lines using linear regression  
(technology)

best-fit line *- by hand*

linear regression equation  $(m) a =$

~~median fit line~~  
correlation coefficient (r)

$b =$

$r =$

$$\left. \begin{array}{l} a = \\ b = \\ r = \end{array} \right\} y = mx + B$$

lin reg.

☺ -1 ~ 0.7 ~ 5 0 .5 .7 1 ☺  
.9+ ☺☺ .9+ ☺☺

**DISEASE** For Exercises 3–6, use the table that shows the number of cases of mumps in the United States for the years 1995 to 1999.

3. Draw a scatter plot and determine what relationship, if any, exists in the data.

L1

L2

U.S. Mumps Cases					
Year	1995	1996	1997	1998	1999
Cases	906	751	683	666	387

Source: Centers for Disease Control and Prevention

$y = -112.3x + 224941.7$

4. Draw a line of fit for the scatter plot.

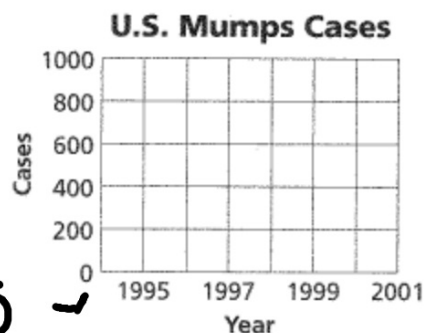
$r = -0.942$

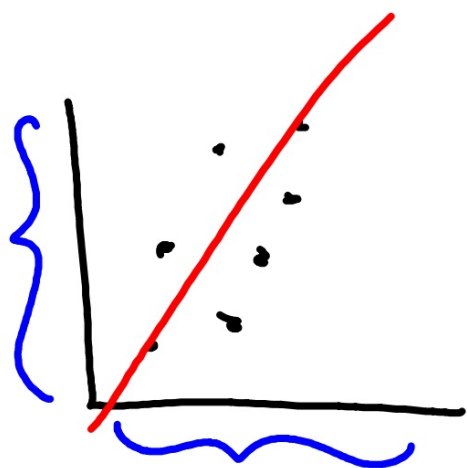
5. Write the slope-intercept form of an equation for the line of fit.

6. Predict the number of cases in 2004.

$y = -112.3(2004) + 224941.7$

-107.5  
none





ZOOS For Exercises 7–10, use the table that shows the average and maximum longevity of various animals in captivity.

L1 →  
L2 →

Longevity (years)								
Avg.	12	25	15	8	35	40	41	20
Max.	47	50	40	20	70	77	61	54

Source: Walker's Mammals of the World

7. Draw a scatter plot and determine what relationship, if any, exists in the data.

8. Draw a line of fit for the scatter plot.

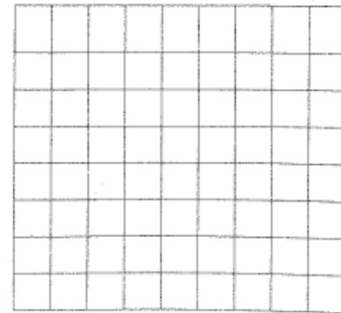
$$1.222(33) + 22.446$$

9. Write the slope-intercept form of an equation for the line of fit.

$$y = 1.222x + 22.446$$

10. Predict the maximum longevity for an animal with an average longevity of 33 years.

$$r = 0.882 \quad 63 \text{ yr.}$$



## Practice

### Modeling Real-World Data: Using Scatter Plots

For Exercises 1–3, complete parts a–c for each set of data.

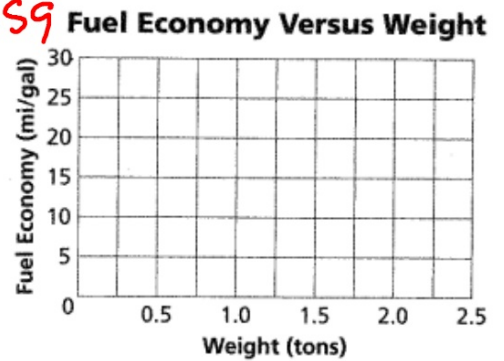
- Draw a scatter plot.
- Use two ordered pairs to write a prediction equation.
- Use your prediction equation to predict the missing value.

1. **FUEL ECONOMY** The table gives the approximate weights in tons and estimates for overall fuel economy in miles per gallon for several cars.

Weight (tons)	1.3	1.4	1.5	1.8	2	2.1	2.4
Miles per Gallon	29	24	23	21	?	17	15

Handwritten notes and a small sketch:

- Equation:  $y = -11.176x + 41.059$
- Sketch: A coordinate plane with y-axis labeled 10, 30 and x-axis labeled 3. An arrow points to the value 2 on the x-axis, with the label "19 mi/gal" below it.
- Labels:  $L_1$  and  $L_2$  are written near the equation.



**2. ALTITUDE** In most cases, temperature decreases with increasing altitude. As Anchara drives into the mountains, her car thermometer registers the temperatures ( $^{\circ}\text{F}$ ) shown in the table at the given altitudes (feet).

<b>Altitude (ft)</b>	7500	8200	8600	9200	9700	10,400	12,000
<b>Temperature (<math>^{\circ}\text{F}</math>)</b>	61	58	56	53	50	46	?

