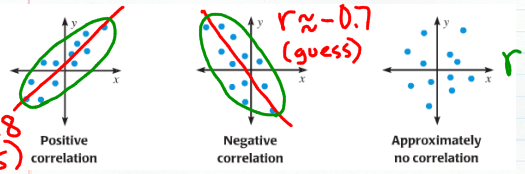
23

Line of Best Fit



r ≈ 0.8 (guess)

r ≈ -0.7 (guess)

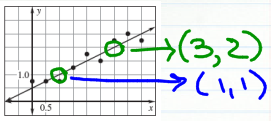
r = 0

r = 1

r = -1

Approximating a best-fit line on graph paper:

1. Make scatterplot.
2. Draw line that comes as close to as many points as possible.
3. Find two points on the line.
4. Use the two points to find an equation for the line.



$y = mx + b$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2-1}{3-1} = \frac{1}{2} = 0.5$

$y = mx + b$

$2 = (0.5)(3) + b$

$2 = 1.5 + b$

$0.5 = b$

$y = 0.5x + 0.5$

Using a graphing calculator:

1. Input data into L1 and L2. (Press STAT-Edit)
2. Do a linear regression. (Press STAT-Right arrow to CALC- choose 4:LinearRegression)

OIL PRODUCTION The table shows the U.S. daily oil production y (in thousands of barrels) x years after 1994.

x	0	1	2	3	4	5	6	7	8
y	6660	6560	6470	6450	6250	5880	5820	5800	5750

a. Approximate the best-fitting line for the data. $y = -129.833x + 6701.556$

b. Use your equation from part (a) to predict the daily oil production in 2009.

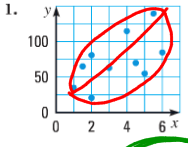
0	1	2	3	4	5	15
1994	1995	1996	1997	1998	1999	2009

$y = -129.833(15) + 6701.556$

$y = 4754$ thousand barrels

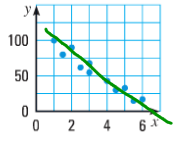
Tell whether the correlation coefficient for the data is closest to -1, -0.5, 0, 0.5, or 1.

1.



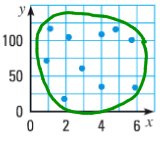
1 or 0.5

2.



-1

3.



0

Put this on the bottom of page 22 of your notebook.

Hooke's Law states that the distance *d* a spring stretches varies directly with the force *f* that is applied to it.

a. Suppose a spring stretches 15 inches when a force of 9 pounds is applied. Write an equation that relates *d* to *f*.

b. Predict the distance that the spring will stretch when a force of 6 pounds is applied.

a. $d = af$

a ↑ Constant of Variation.

$15 = a(9)$

$\frac{15}{9} = a = \frac{5}{3}$

* $d = \frac{5}{3}f$

b.) $d = \frac{5}{3}(6)$

$d = 10$ in.

$\frac{5}{\cancel{3}_1} \cdot \frac{\cancel{6}^2}{1}$

$d = \frac{5}{3}(6)$

$d = 10$ inches

$\frac{10}{9} = a = \frac{5}{3}$

↑ constant of Variation