

Scatter Plots & Line of Best Fit Day II

1) The accompanying diagram shows the number of cricket chirps per minute recorded at various Fahrenheit temperatures.

Temperature (°F)	Number of Cricket Chirps Per Minute
52	50
56	78
62	90
72	115

Determine a line of best fit for this data.

$y = mx + b$
 $m = 3.25$
 $b = -119$

$y = 3.25x - 119$

$(52, 50) \quad (72, 115)$
 $x_1 \quad y_1 \quad x_2 \quad y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{115 - 50}{72 - 52}$

$m = \frac{65}{20}$

$m = 3.25$

$(52, 50) \quad m = 3.25$
 $x \quad y$

$y = mx + b$
 $50 = (3.25)(52) + b$
 $50 = 169 + b$
 $-169 \quad -169$
 $-119 = b$

2) The chart below shows the number of minutes studied and the grade received on a test.

Minutes Studied (x)	Test Grade (y)
15	50
40	67
45	75
60	75
70	73
75	89

Determine a line of best fit for this data.

$y = mx + b$
 $m = 0.65$
 $b = 40.25$

$y = 0.65x + 40.25$

$(15, 50) \quad (75, 89)$
 $x_1 \quad y_1 \quad x_2 \quad y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{89 - 50}{75 - 15}$

$m = \frac{39}{60}$

$m = 0.65$

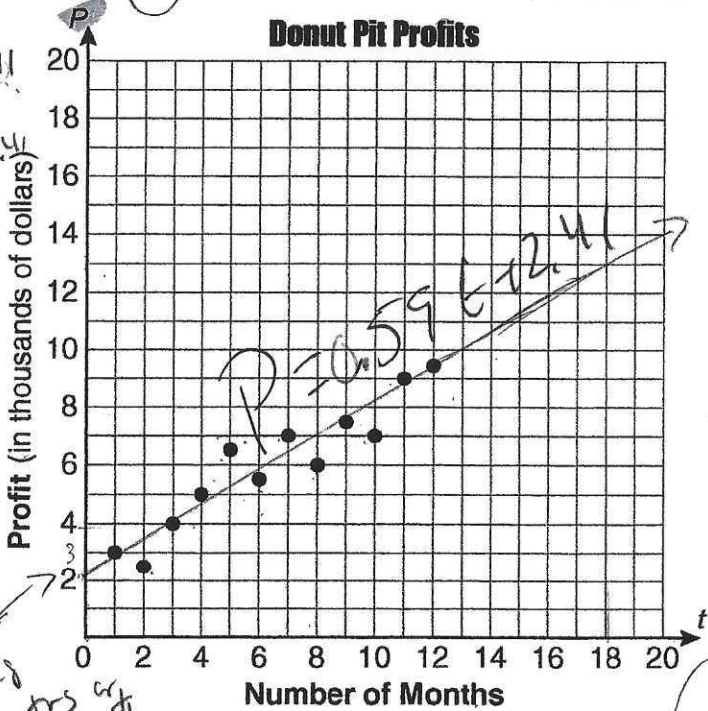
$(15, 50) \quad m = 0.65$
 $x \quad y$

$y = mx + b$
 $50 = (0.65)(15) + b$
 $50 = 9.75 + b$
 $-9.75 \quad -9.75$
 $b = 40.25$

Scatter Plots & Line of best fit

3) Megan and Bryce opened a new store called the *Donut Pit*. Their goal is to reach a profit of \$20,000 in their 18th month of business. The table and scatter plot below represent the profit, P , in thousands of dollars, that they made during the first 12 months.

t (months)	1	2	3	4	5	6	7	8	9	10	11	12
P (profit, in thousands of dollars)	3.0	2.5	4.0	5.0	6.5	5.5	7.0	6.0	7.5	7.0	9.0	9.5



$y = mx + b$
 $m = 0.59$
 $b = 2.41$

$y = 0.59x + 2.41$

$P = 0.59t + 2.41$

$(1, 3)$ $(12, 9.5)$
 $x_1 y_1 \quad x_2 y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1}$
 $m = \frac{9.5 - 3}{12 - 1}$
 $m = \frac{6.5}{11}$
 $m = 0.59$

$(1, 3)$ $m = 0.59$
 $x y$

$y = mx + b$
 $3 = (0.59)(1) + b$
 $3 = .59 + b$
 $-59 \quad -59$
 $b = 2.41$

$P = 0.59t + 2.41$

- (a) Draw a reasonable line of best fit. *need to get the equation 1st*
- (b) Using the line of best fit, predict whether Megan and Bryce will reach their goal in the 18th month of their business. [Justify your answer.] *begin here! Start line here!*

NO, they only get to \approx \$12,500

not \$20,000

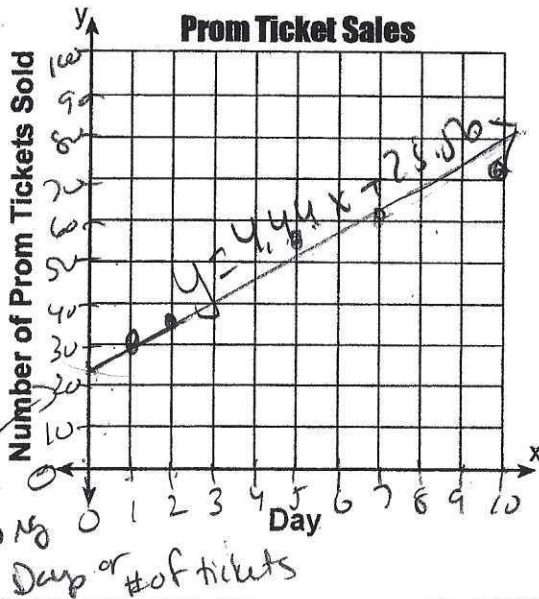
* 18 months is extrapolating b/c it is outside the plotted values

4) The table below shows the number of prom tickets sold over a ten-day period.

smallest x
Prom Ticket Sales
largest x

Day (x)	1	2	5	7	10
Number of Prom Tickets Sold (y)	30	35	55	60	70

Plot these data points on the coordinate grid below. Use a consistent and appropriate scale. Draw a reasonable line of best fit and write its equation. *must do 1st*



$$y = mx + b$$

$$m = 4.44$$

$$b = 25.56$$

begin

$$y = 4.44x + 25.56$$

Start line here

$$(1, 30) \quad (10, 70)$$

$$x_1, y_1 \quad x_2, y_2$$

$$(1, 30) \quad m = 4.44$$

$$x, y$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{70 - 30}{10 - 1}$$

$$m = \frac{40}{9}$$

$$m = 4.44$$

$$y = mx + b$$

$$30 = (4.44)(1) + b$$

$$30 = 4.44 + b$$

$$\begin{array}{r} -4.44 \quad -4.44 \\ \hline \end{array}$$

$$b = 25.56$$

Notes

Equation for the line of best fit (Trend line)

$$y = mx + b$$

m = slope

b = y -intercept

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

✖✖ When calculating the slope, use the smallest + largest x -value

☆ slope: Round to the nearest hundredth

✖ make sure to start the line at the y -intercept + write the equation on the line