26	Use the equation of a linear model to make predictions about the data

Use the data sets for practicing linear regression.

1)   Theater ticket sales on successive nights

Patrons (p)	Revenue (R)
32	480
33	495
40	600
81	1215
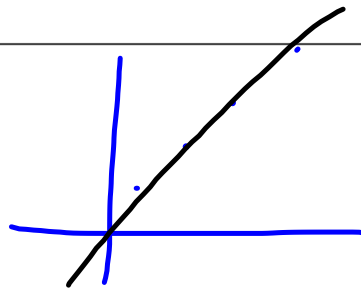
$y = 15x + 0$ or $y = 15x$

a)   Derive a linear model for the data, rounding to the thousandth.

b)   Use the linear model to predict revenue if 121 patrons attend. $y = 15(121)$

$y = \$1815$

c)   What is the value of the correlation coefficient? In general, what do correlation coefficient values indicate? What does this value tell us about this data in particular?

$r = 1$ positive, strong, correlation

d)   What does the slope represent?
$\dfrac{\Delta y}{\Delta x} = \dfrac{15}{1} = \$15$ per patron in revenue

e)   What does the y-intercept represent?
$(0,0)$ When there's 0 patrons theatre makes $0
x y

2. The table below shows the percent of budget the average person spends on entertainment at various ages. Use it to answer the following questions.

(handwritten: X, paycheck, y)

Age	30	40	50	60	70	80
% of budget spent on entertainment	6.1	6.0	5.4	5.0	4.7	3.4

(handwritten: $y = -\frac{1}{20}x + 7.4$)

Use (40, 6.0) and (60, 5.0) to write a linear equation.

(handwritten:)
$y = mx + b$

$\frac{\Delta y}{\Delta x}$ $\begin{array}{c|c} 40 & 6.0 \\ 60 & 5.0 \end{array}$ $\frac{-1}{20}$ $m = -\frac{1}{20}$

$y = -\frac{1}{20}x + b$

$3.4 = -\frac{1}{20}(80) + b$

$3.4 = -4 + b$

$+4 \quad +4$

$7.4 = b$

What is the y-intercept from your line? **7.4** What does your y-intercept mean in the context of the problem?

(handwritten:) 7.4% of budget you spend when you are 0 yrs. old.

Does your interpretation of the y-intercept make sense? Why or why not?

(handwritten:) (0, 7.4) when you're a baby you can't spend money

What is the slope from your line? **$-\frac{1}{20}$** What does your slope mean in the context of the problem?

(handwritten:) $m = -\frac{1}{20}$ $\frac{\Delta y}{\Delta x}$ change you spend 1% less on your budget every 20 years.