

Name: \_\_\_\_\_

Show work needed to justify your answer.

Date: \_\_\_\_\_

HW: # 30a: Math IBSL - Standard 29 - Least Squares Regression

5 points

- 1 For seven different theatres, the table below shows the cost of theatre tickets and the number of tickets sold in that theatre over the course of a week.

Cost (\$x)	12	15	18	18	22	25	30
Tickets sold (y)	45	44	45	42	40	34	26

- a Find the regression line of  $y$  on  $x$  and use it to predict how many tickets, to the nearest whole number, would be sold at a theatre which charged \$20 per ticket. (a)

$$y = -1.08x + 61.0$$

$$y = -1.08(20) + 61.0$$

$$y = 39 \text{ tickets}$$

- b Find the regression line of  $x$  on  $y$  and use it to predict the cost of a ticket, to the nearest Dollar, at a theatre which sold 35 tickets. (b)

$$x = -0.814y + 52.1$$

$$x = -0.814(35) + 52.1$$

$$x = 24 \text{ dollars}$$

- 4 The success of a shopping mall is related to its distance, in km, from the town centre. For 10 different malls, the number of visitors per hour and the distance from the town centre were recorded.

Distance (km)	1	5	9	12	14	19	21	24	30	34
Visitors	180	164	148	120	118	90	85	82	65	60

- a Estimate how many people per hour would visit a mall which is 7 km from the town centre.
- b A developer wants to build a mall which will attract at least 100 visitors per hour. Estimate the furthest distance from the town centre that he should build it.

a)  $y = -3.82x + 175.8$   
 $y = -3.82(7) + 175.8$   
 $y = 149 \text{ People Per-hour}$

b)  $x = -0.249y + 44.6$   
 $x = -0.249(100) + 44.6$   
 $x = 19.7 \text{ km}$