

Example 5: Linear Application with Verbal Description Given

The student council is planning to hold a fundraising dinner. They will profit \$8 per dinner ticket and the other costs for the dinner are for the hall rental and the music, which total to \$300. Fill in the table below for this situation.

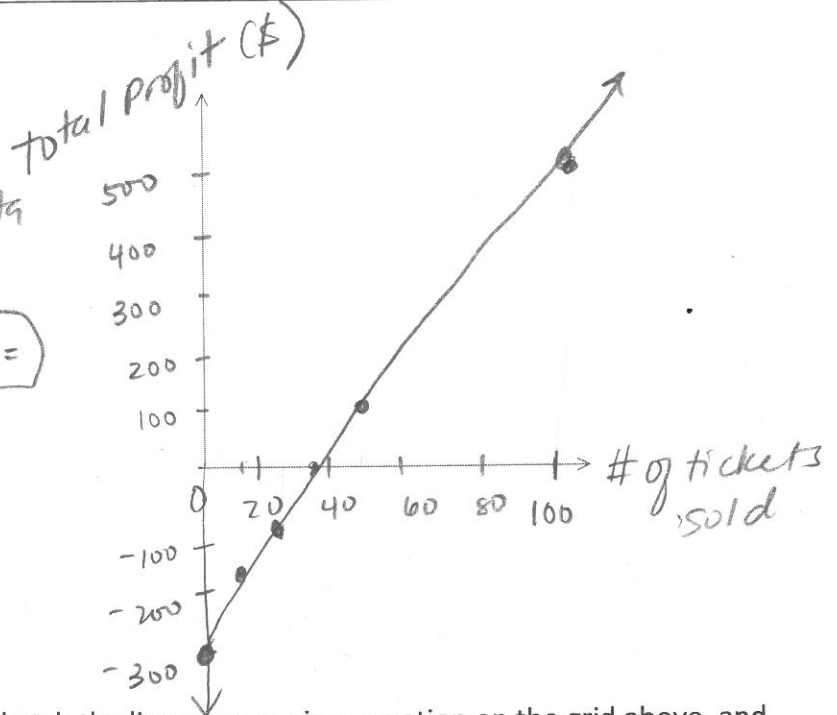
indep. x

# of Tickets Sold	0	15	25	50	100	L1
Total Profit \$	-300	-180	-100	100	500	L2

dep. y

a) Graph the scatterplot of the data.

- **STAT** **1** Edit enter data on L1 & L2
- Change window **2nd** **Y=**
 - Xmin = 0
 - Xmax = 120
 - Ymin = -300
 - Ymax = 500



b) Is the relation linear? Explain. If so, sketch the linear regression equation on the grid above, and write the regression equation below.

Yes,
 $y = 8x - 300$

STAT → **CALC** → **4** Lin Reg
 Store Reg Eq **VAR** Y VARS Enter 4 times

d) How many tickets do they have to sell in order to 'break even'? To break even means to have a 'profit' of \$0.

$Y_2 = 0$, **2nd** **TRACE** **5** Intersect
 37.5 tickets. We need to round off to 38 tickets.

e) What is the profit if 180 tickets are sold?

given $x = 180$
 $y = 8(180) - 300$
 $y = 1140$

f) If their goal is to make \$1000, how many tickets do they have to sell?

given $y = 1000$
 $y = 8x - 300$
 $1000 = 8x - 300$
 $+ 300$
 $1300 = 8x$
 $\frac{1300}{8} = \frac{8x}{8}$
 $162.5 = x$

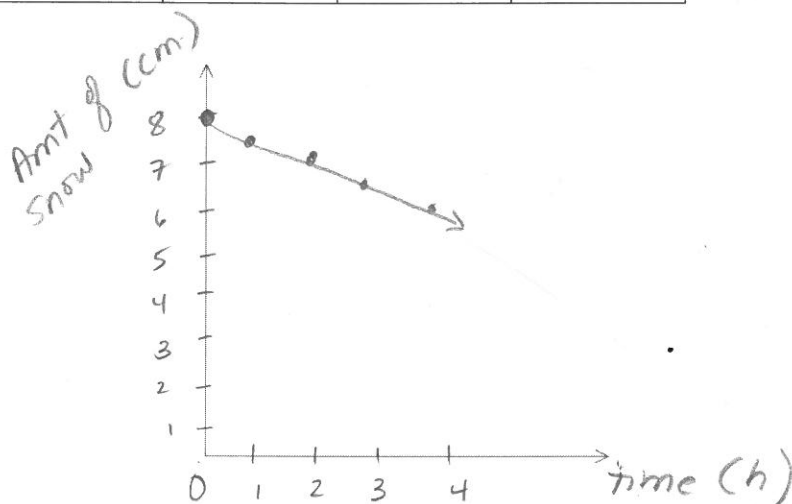
Round off to 163 tickets
 $Y_2 = 1000$
2nd **TRACE** **5** Intersect.

Example 6: Linear Application with Verbal Description Given

There is 8 cm of snow on the ground. It is melting at a rate of 0.5 cm per hour. Complete the table shown below.

x	Time (hours)	0	1	2	3	4	L1
y	Amount of Snow (cm)	8	7.5	7	6.5	6	L2

a) Graph the scatterplot of the data.



b) Is the relation linear? Explain. If so, sketch the linear regression equation on the grid above, and write the regression equation below.

yes. $y = -0.5x + 8$

c) How will it take for the snow to melt completely? *calc. the x-int.*

$x\text{-int} = 16 \text{ hours}$

d) When will the snow melt to a depth of 3.75 cm? *given y-value = 3.75*

$x = 8.5$ $y = 3.75$

8.5 hours

e) What are we assuming regarding our answers to parts (c) and (d)?

- We are assuming that the snow melts at the same rate.
- We also assume that no more snow falling.