-'ve +'ve slope y int

$y = mx + b$

Example 3 Linear Application with Equation Given

The equation that models a comet travelling at terminal velocity towards Earth is:

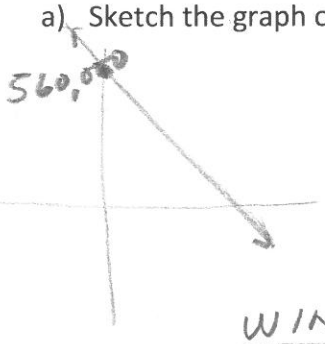
height

$$y = -10000x + 560000$$

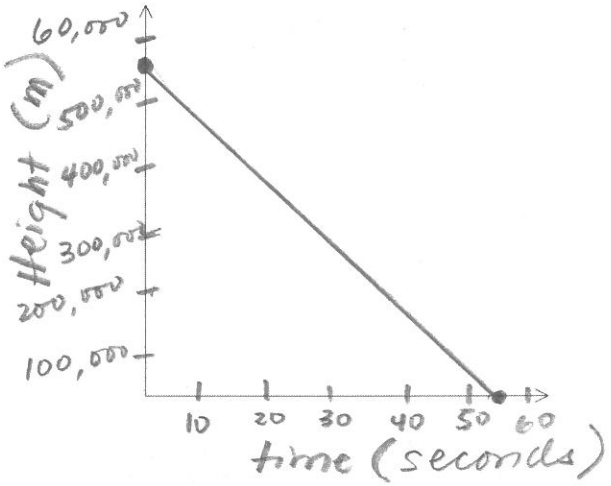
time

where *y* represents the height of the comet (in metres) and *x* represents the time in seconds after the comet entered the Earth's atmosphere.

a) Sketch the graph of this situation.



WINDOW



b) How high will the comet be after 5 seconds? ← given the time

2nd trace 1 value enter X = 5 ENTER

The height is 510,000 meters.

c) When will the comet reach a height of 100 m? ← given the height (y-value)

$Y_2 = 100$

2nd TRACE 5 Intersect

The time is 55.99 seconds.

d) After how many seconds will the comet hit the ground?

← the height is zero. (y-value)

56 seconds

Example 4: Linear Application with Table of Values Given

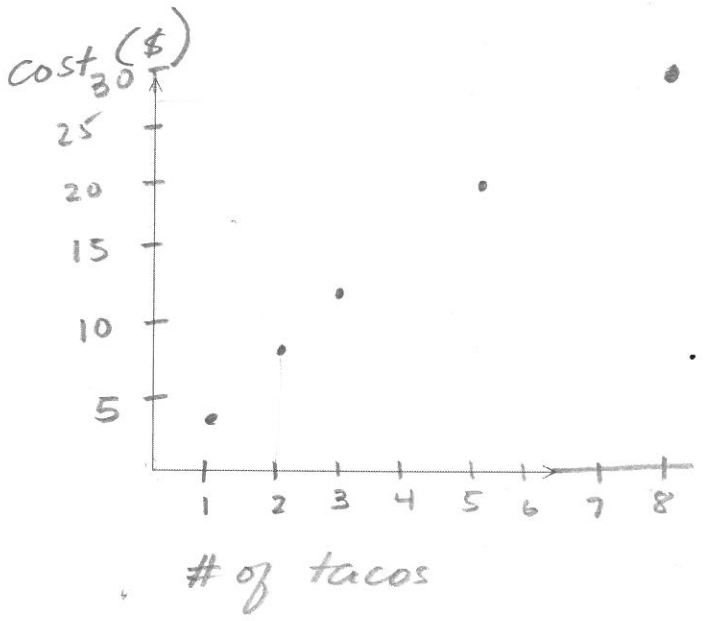
The cost of tacos purchased depends on the number ordered. The table below shows the cost of purchasing tacos from a food truck.

x	**Number of tacos ordered**	1	2	3	5	8	L_1
y	**Cost $**	3.50	7.00	10.50	17.50	28.00	L_2

a) Graph the scatterplot of the data

STAT
1: Edit
enter values
on L_1 and L_2

Xmin = 0
Xmax = 10
Ymin = 0
Ymax = 30



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

yes, the points are on a straight line.

$y = 3.50x + 0$

x represents # of tacos.
y represents the cost

c) How much will it cost if 20 tacos are ordered?

← given x-value $x = 20$

2nd TRACE 1 value $x = 20$
The cost is $70

d) How many tacos could you buy with $100.00?

← given y-value

$Y_2 = 100$

2nd TRACE 5: Intersect
We could buy 28 tacos. (Rounded down).

#