

LESSON # 18 page 119

Inversely Proportional Situations

Inverse proportion (also called inverse variation situations) is when one value (x) increase as the other value (y) decreases.

direct

X	Y
2	10
3	15
4	20
5	25

Incr. *Inc.*

inverse

X	Y
1	100
2	50
4	25
5	20
10	10
20	5

Incr. *Decr.*

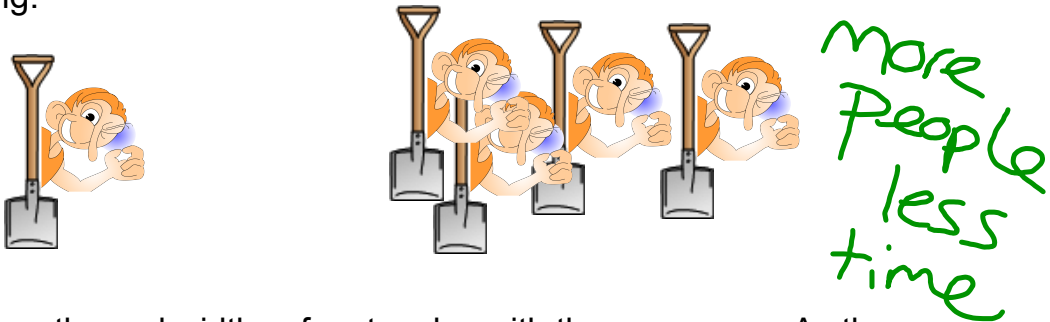
For Example: Remember what are my variables x and y?

- The time taken for a journey is inversely proportional to the speed of travel.

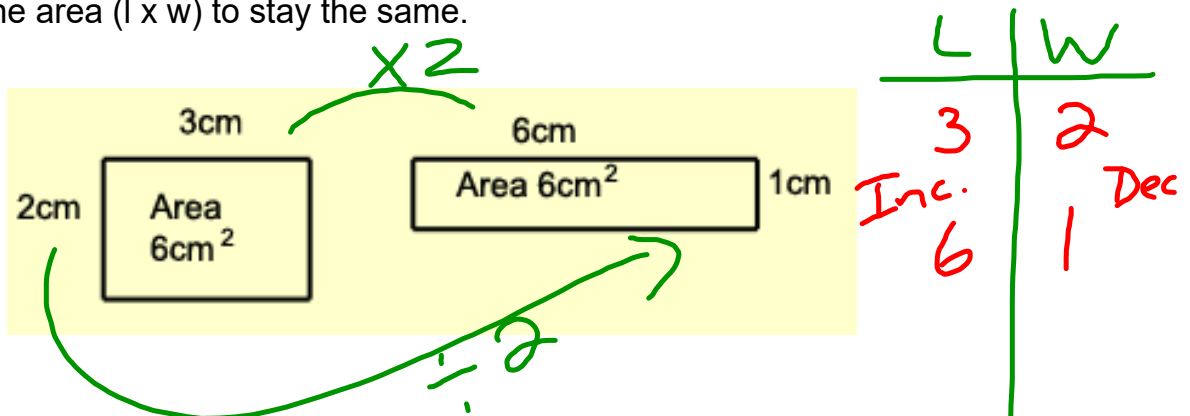
faster => less time

Time x	y Speed
3	90 km/h
2.25	120 <i>Incr.</i>

- The time needed to dig a hole is inversely proportional to the number of people digging.



- The lengths and widths of rectangles with the same area. As the length of one side doubles, the width has to be halved in order for the area (l x w) to stay the same.



- The secondary 5 students are organizing the graduation dance. The fund-raising activities during school year have enabled the graduation dance committee to accumulate a surplus of \$2 400. This amount must be shared with every student who attends the dance.

**We say that each person's share is inversely proportional to the # of participants.*

number of participants	each person's share
50	48
60	40
100	24
120	20
150	16
200	12

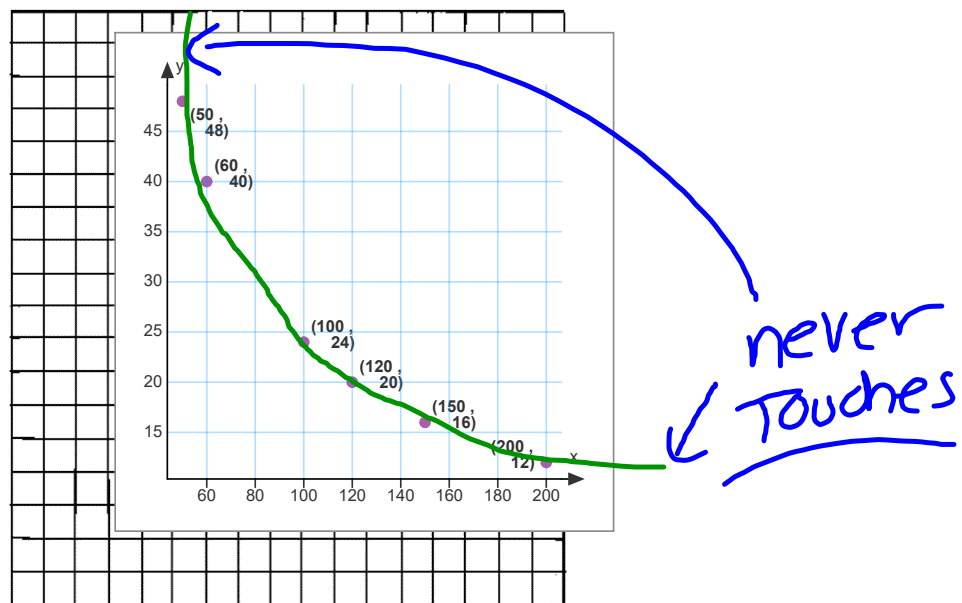
Incr.

Decr.

Product of $x(y)$ is always \$2400

Why?

**An inverse proportional situation is represented graphically by a curve that gradual approaches the axes X & Y .*



Inverse Proportionality

1. The employees of a grocery store won \$5 000 in a lottery that they must share.
- a) What are the two variables in this situation?

- b) Construct a table of values representing this situation.

Number of employees	1	2	4	5	8	10
Each person's share (\$)						

- c) What is the product of the independent variable and the dependent variable?

- d) What will be each person's share if 20 employees participated in the lottery? _____

- e) How many employees participated in the lottery if they each received \$200?

- f) Is this situation a direct or an inverse proportional situation?

- g) What will happen to each person's share if the number of participants triples?

2. Four factory workers unload a truck full of merchandise of its contents in 45 minutes and six workers can unload it in 28 minutes. According to the given information, is this situation

- a) directly proportional? _____

- b) inversely proportional? _____

3. A student must do a project on a rectangular cardboard which has an area of 200 dm^2 . We consider the two variables: the length and the width.

- a) Complete the following table of values.

Length (dm)	4	5	10	20	40	50
Width (dm)						

- b) If x represents the length and y the width, give the rule for this situation.

- c) What type of proportional situation do we have?

- d) Can the cardboard be square? What would the side length of the cardboard then be?

- e) Draw, in the Cartesian plane on the right, the graph representing this situation.

- f) Give a characteristic of this graph.

