

Concept: Linear Relations

Name: _____

COMPUTER COMPONENT

Instructions: In  follow the **Content Menu** path:

Graphing > Linear Relations



Work through all Sub Lessons of the following Lessons **in order**:

- *What is a Linear Relation?*
- *Graphs of Linear Relations*
- *The Taxi Example*
- *The Elastic Example*
- *Lightning Example*
- *Basketball Example*
- *Lines of Best Fit*

Additional Required Materials: Graph/Grid Paper



As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

NOTES

A **Linear Relation** produces a graph, which is a _____ line.

1. Record **Example 1**, *The Taxi Example*, below.

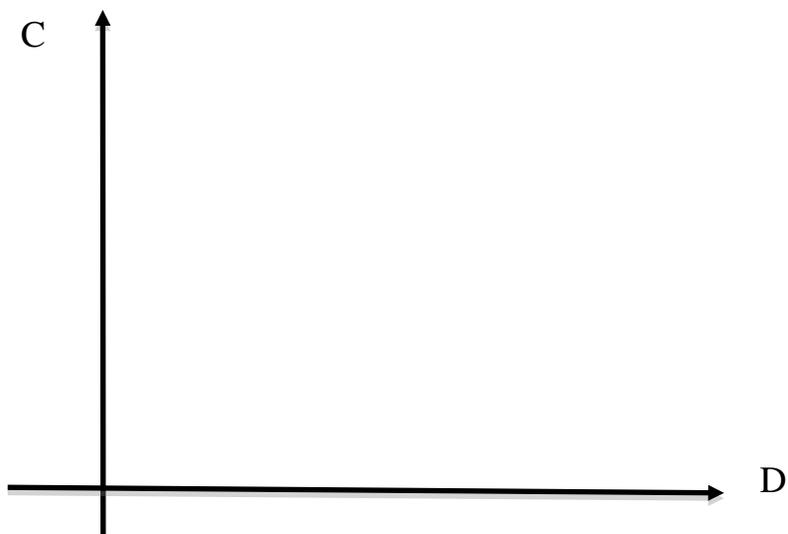
A Taxi charges a fixed fee of \$4 plus \$1 per kilometer.

- Pick 6 ordered pairs and complete the table below.

A chart/table helps us see patterns and find the equation of the relation.

Distance	Cost

➤ Plot the points on the graph below.



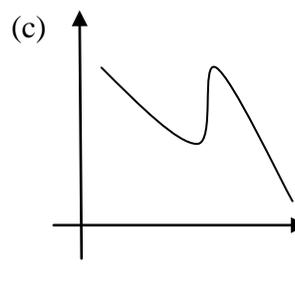
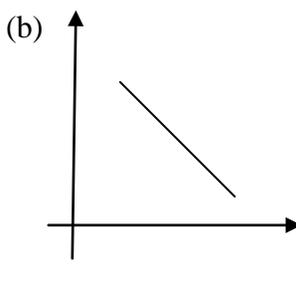
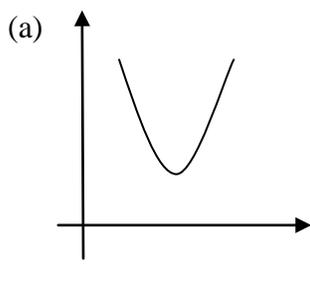
In general, **D**-0 and **C**-4 are called _____.

For the remaining **Examples**, fill in the table below.

Example	Can we join the points here?	Why or why not?
<i>Elastic</i>		
<i>Lightning</i>		
<i>Basketball</i>		

OFF COMPUTER EXERCISES

1. Classify each of the following graphs as **Linear** or **Non-Linear**.

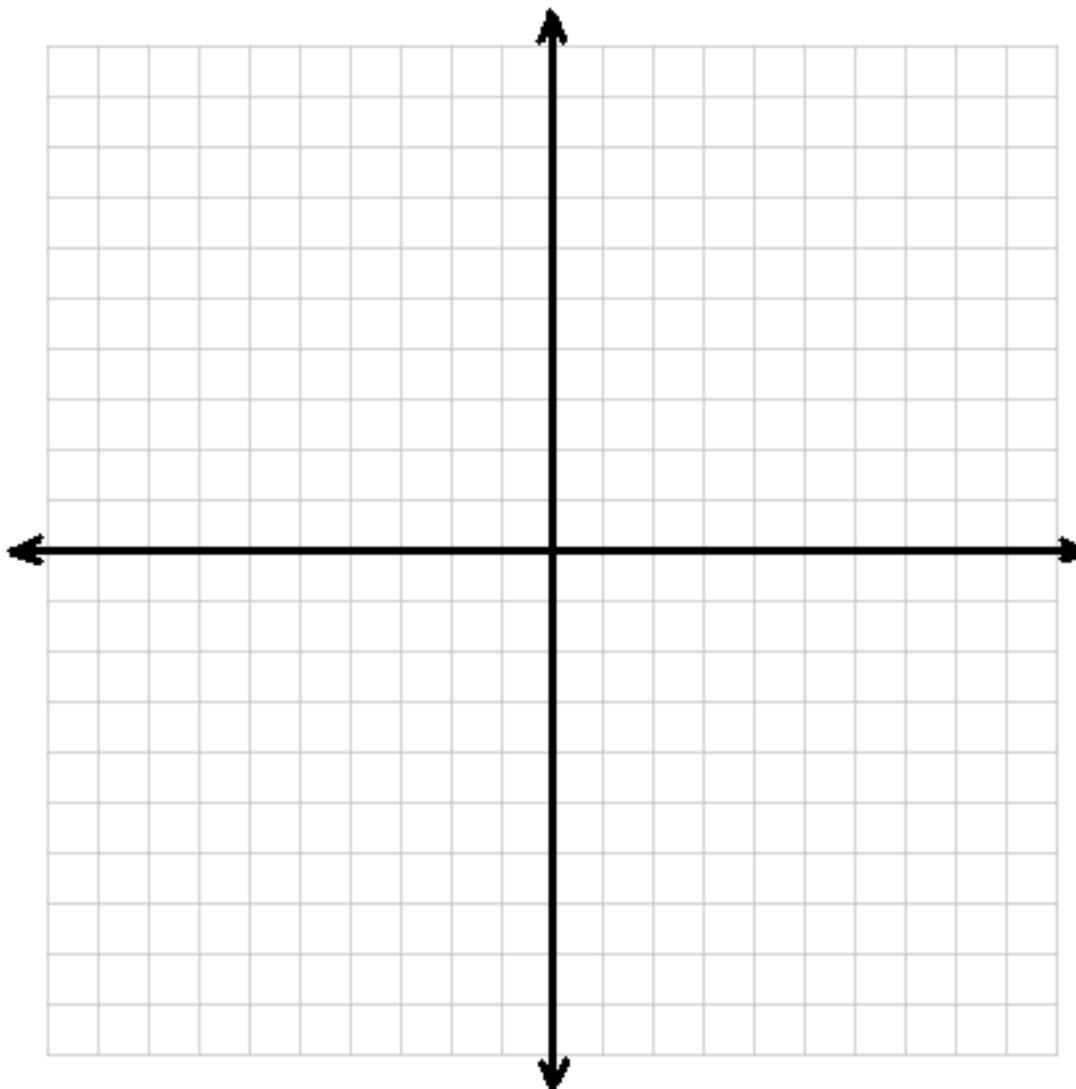


2. You are given the equation $y = 4x - 3$

➤ First fill in the following table.

x	-3	-2	-1	0.5	1	2	2.5	3
y								

➤ Graph your results below.



(a) Is the relation **Linear** or **Non-Linear**? _____

(b) Use your graph on grid paper to help you predict the point at which y is 3.

When y is 3, then x is _____.

(c) Use the equation to check the value of x , when y is 3.

$$y = 4x - 3$$

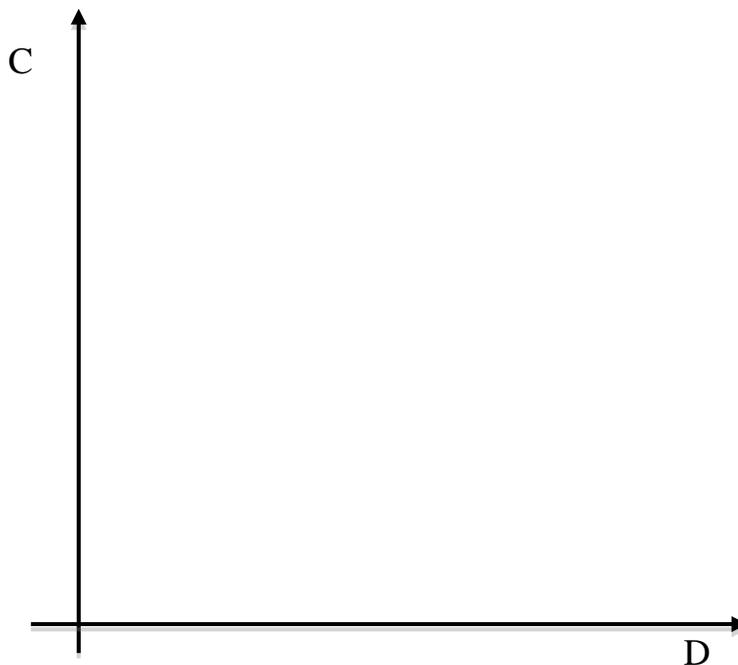
3. A Rent-A-Heap Car Rental Company charges a fixed fee of \$100 per day plus an additional \$0.50 for every mile driven.

A chart/table helps us see patterns.

- Pick 6 ordered pairs and complete the table below.

Distance	Cost

- Plot the points on the graph below.



The equation of the relation is _____.

4. You are selling tickets to your High School musical.
 The tickets for adults are \$6 each and the tickets for students are \$4 each.
 If the total receipts from the musical amount to \$2400, then complete the following.

(a) Let x represent the number of adult tickets sold at \$6 per person.

Then, the total receipts from sales to adults are _____.

(b) Let y represent the number of student tickets sold at \$4 per person.

Then the total receipts from sales to students are _____.

(c) The equation that represents the above situation is

_____ = _____.

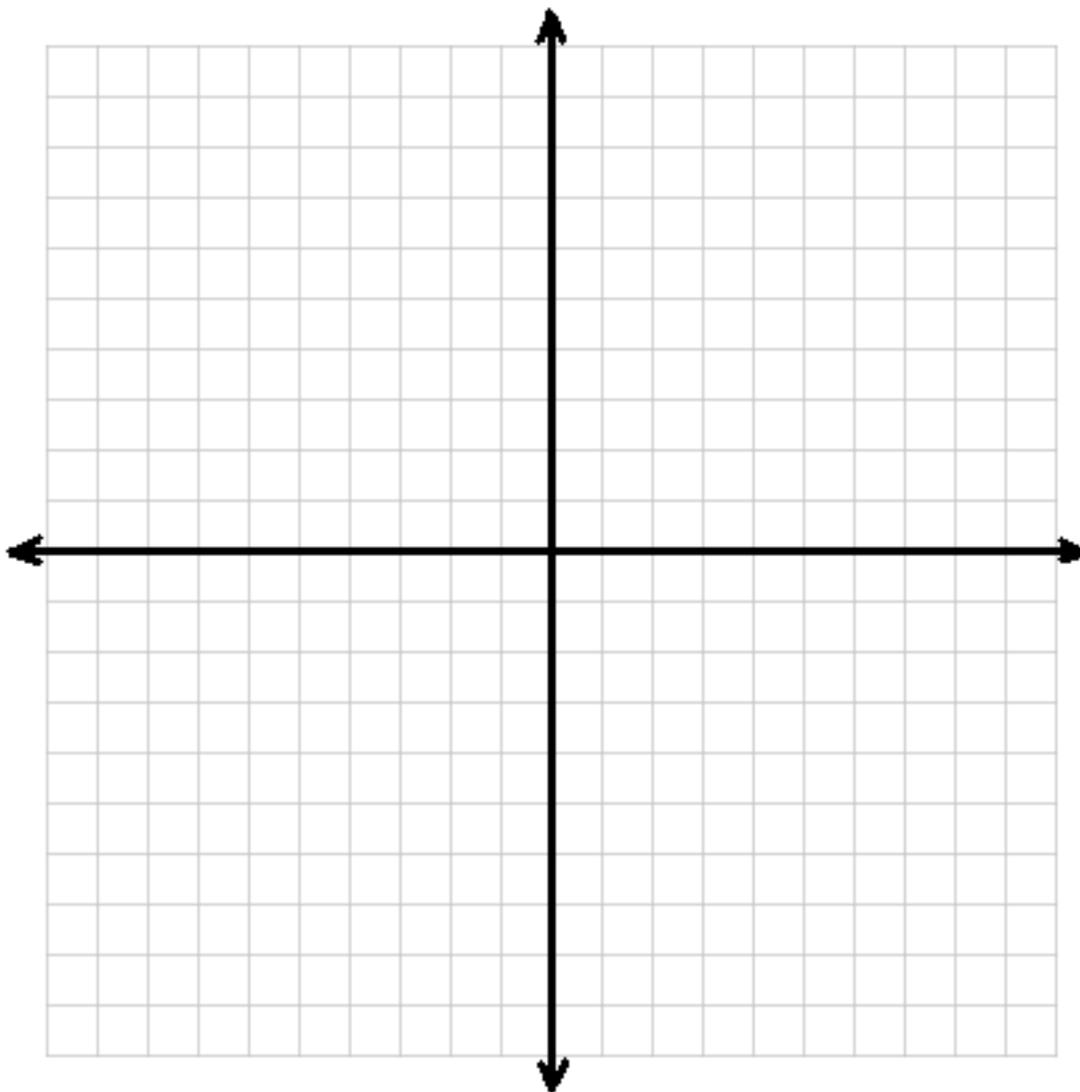
Complete the chart/table ordered pairs of the relation.

x	y	6x	4y	Total receipt

NOTE: *You may need to add more points.*

- Use grid paper to accurately graph points, which represent the above situation.

NOTE: *Each point will represent another possibility for x (number of adults) & y (number of students) which will result in a receipt of \$2400.*



(d) *Is it reasonable to join the points?* _____

(e) Look for patterns on the graph. *When x increases, then y* _____.

NOTE: *You will require additional graph/grid paper for the following activities.*

5. Follow the instructions for each of the following equations (which represent relations.)

- Make a table of values.
- Plot/draw the corresponding graph on grid paper
- In each case, use $-2, -1, 0, 1, 2$ for the x -coordinates.

Part 1:

On the same set of axis, graph each of the following...

- (a) $y = 2x + 1$
- (b) $y = 2x + 3$
- (c) $y = 2x + 5$
- (d) $y = 2x - 4$
- (e) $y = 2x - 6$

Analysis: *How are the above graphs alike?* _____

Analysis: *How are the above graphs different?* _____

Part 2:

On the same set of axis, graph each of the following...

- (a) $y = x + 2$
- (b) $y = -3x + 2$
- (c) $y = 5x + 2$
- (d) $y = 4x + 2$
- (e) $y = -2x + 2$

Analysis: *How are the above graphs alike?* _____

Analysis: *How are the above graphs different?* _____

Once you have completed all parts of this booklet, hand it in along with the required graph to your teacher.