

## LINEAR RELATIONS

- A linear relation is a pattern made by a set of points that lie on a straight line. These patterns can be used to show many different things . . .
1. Rachel takes care of homes during the summer while their owners are away on vacation. She charges \$8, plus \$2.50 a day.
    - a. Create a table (chart) that shows the charges when the owners are away for up to 5 days.
    - b. Write an equation that relates the charge,  $C$  dollars, to the number of days,  $n$ , that the owners are away.
    - c. What will the charge be when the owners are away for 14 days? Show the math to prove your answer.
    - d. How many days were the owners away when the charge was \$33?
  2. Shirley has \$540 in her bank account. She withdraws \$35 each week to cover her expenses.
    - a. Write an equation that relates the amount of money in her account,  $A$  dollars, after  $n$  weeks.
    - b. Determine the amount of money in Shirley's account after 8 weeks.
    - c. What will Shirley have in her account at the close of one full year?

3. The cost of a taxi ride is the sum of a fixed cost of \$2.50 for the first kilometer, plus \$1.75 for each additional kilometer.
- Write an equation that relates the cost of the taxi ride,  $F$  dollars, to the distance travelled,  $d$ .
  - Determine the cost of a 28km taxi ride. Show all the math!

## TABLES OF VALUES

4. Each table of values represents a "linear relation". Complete each table and write a brief statement that explains your reasoning.

a.

$x$	$y$
1	
2	
3	14
4	18
5	

b.

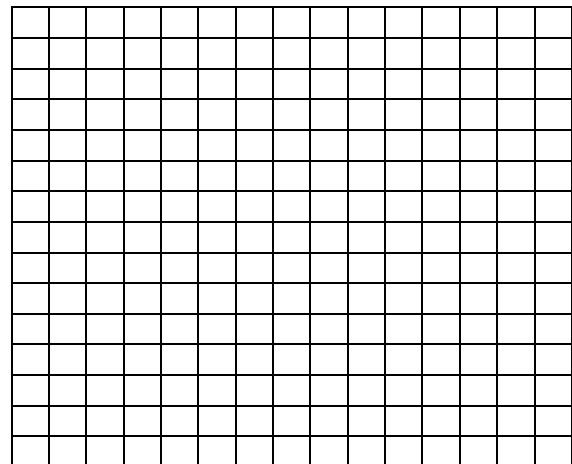
$x$	$y$
1	
3	3
5	-1
7	
9	

c.

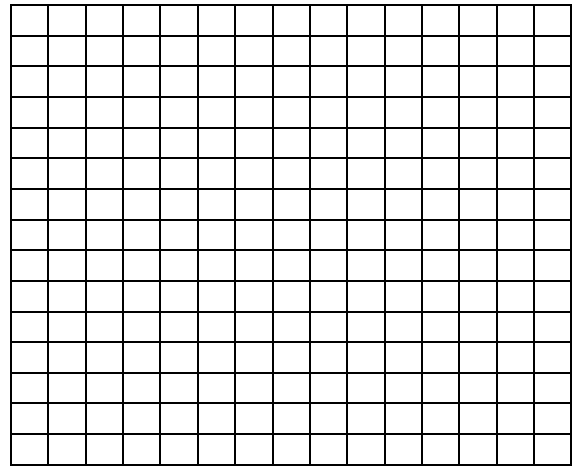
$x$	$y$
4	
2	14
0	19
-2	
-4	

5. Create a table of values for each of the following linear relations, and then graph the equation. Use values of  $x$  from (-2) thru (2).

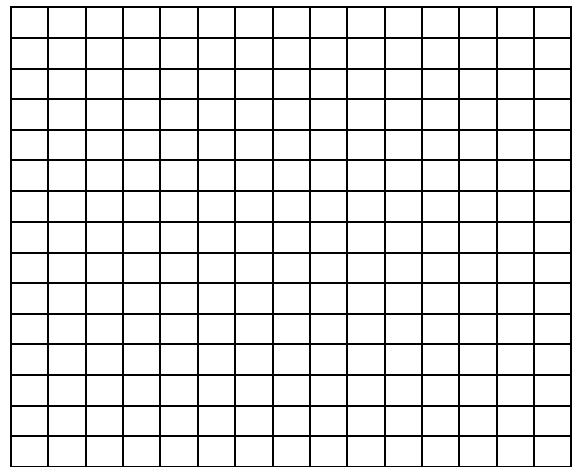
a.  $y = x + 4$



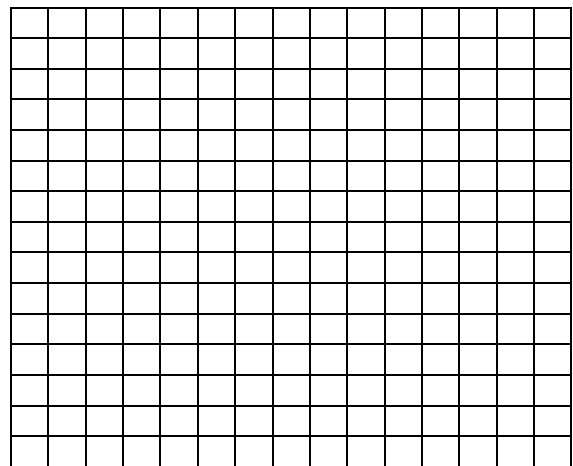
b.  $y = 2x + 1$



c.  $y = 5 - 2x$



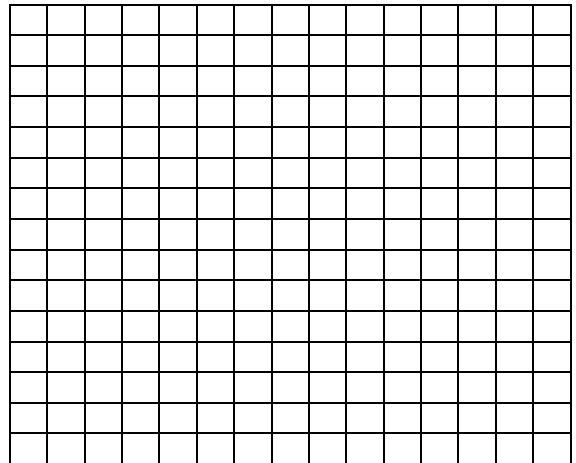
d.  $2y = 3x - 12$



6. A computer company charges \$80 for a service call, plus \$50 an hour for labour.

a. Create a table of values to show the relationship between the time in hours for the service call, and the total cost.

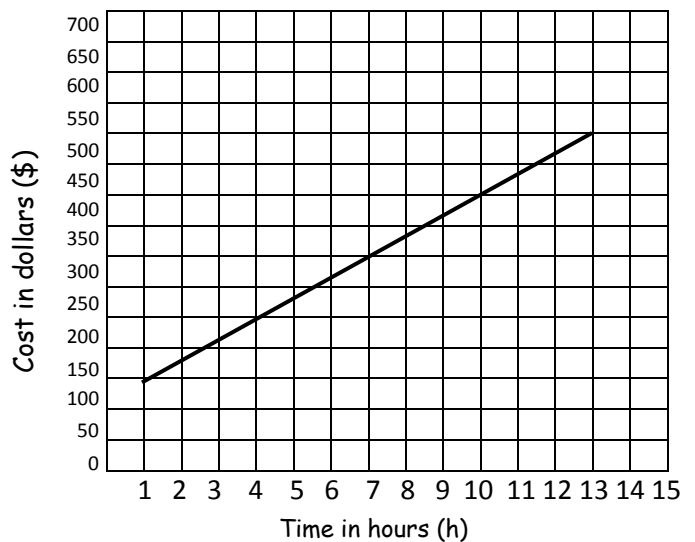
b. Is this a "Linear Relation"? Justify your answer . . . a graph will help ☺



c. Let  $n$  represent the time in hours for the service call, and  $C$  represent the total cost in dollars. Write an equation that relates  $C$  and  $n$ .

d. How much will a 7 hour service call cost? Show all the math.

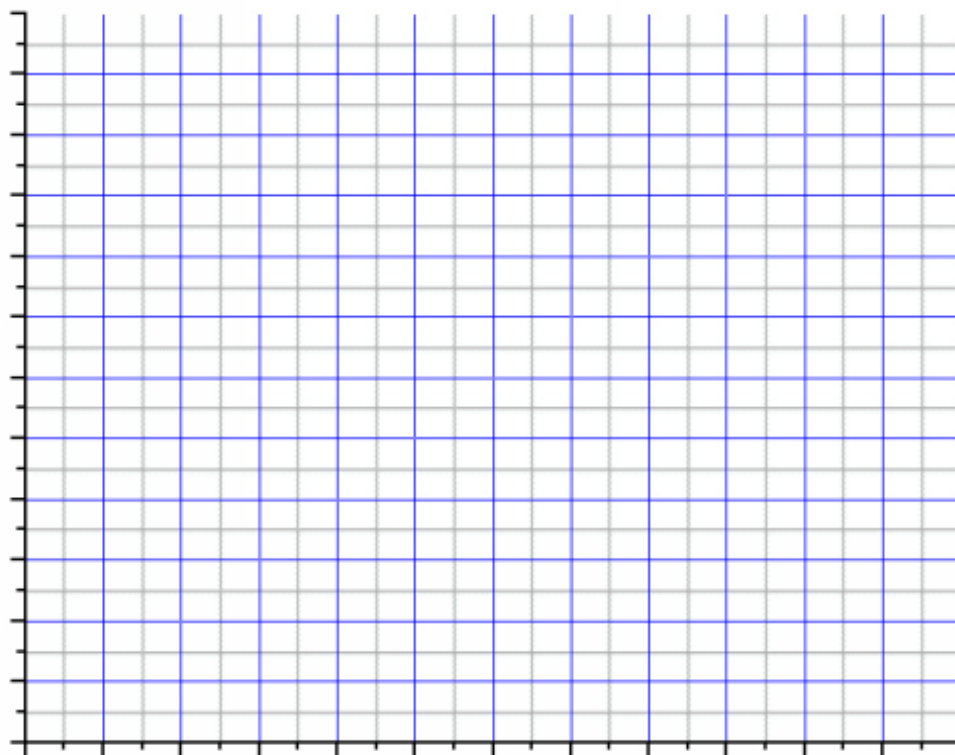
7. Examine the following graph. Write a brief scenario and a corresponding equation that could be used to describe the relation depicted.



## GRAPHING

1. a) Create a table of values for the relation  $y = 1\frac{1}{2}x + 3$ , then graph the relation.

$x$	$y$
0	
2	
4	
6	
8	
10	

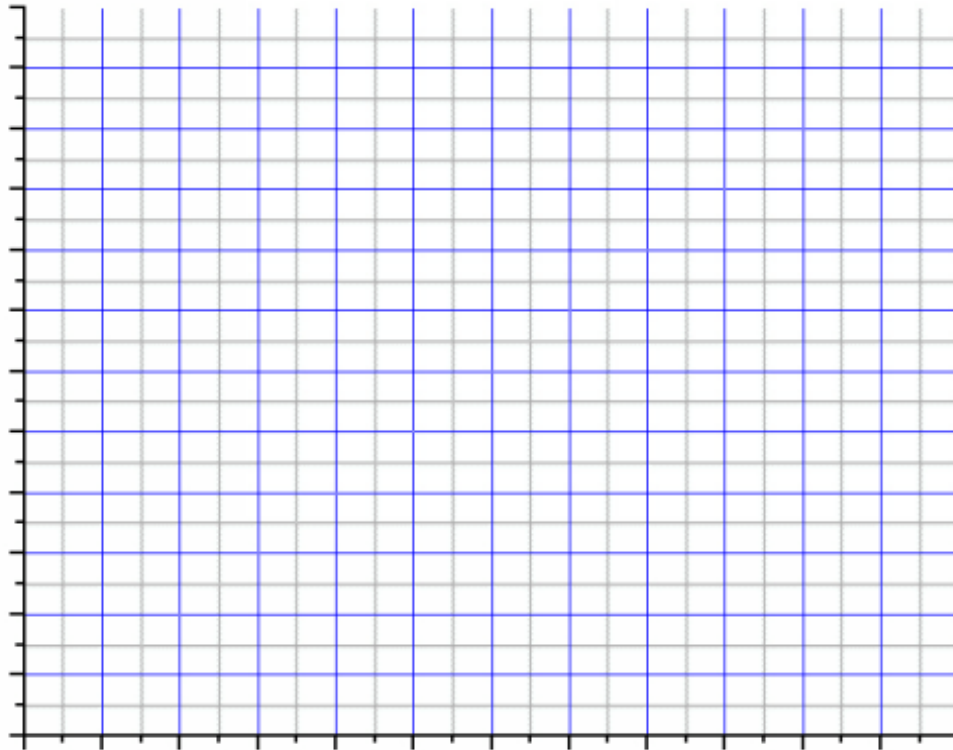


b) Is the relation linear? How do you know?

c) Extrapolate the value of  $y$  when  $x = 33$ .

2. Sam has \$100 in his savings account. Each week he adds \$20.
- Write an equation that relates the amount of money in his account,  $A$  dollars, after  $t$  weeks.
  - Create a table of values for the relation, then graph it. Will you join the points on this graph? Explain.

$t$	0	1	2	3	4	5
$A$						



- At what point will Sam have \$50.00 in his account?