4.2: Linear Relations
Worksheet

1. For each table of values below:
   i) Does it represent a linear relation?
   ii) If the relation is not linear, explain how you know.
   iii) If the relation is linear, describe it.

a) i) yes

iii) a constant
change in x
produces a
constant change
in y.

a)

x	y
1	5
2	12
3	19
4	26
5	33

$+2$ $+7$
$+2$ $+7$
$+2$ $+7$
$+2$ $+7$

b)

x	y
1	1
3	3
5	7
7	13
9	21

$+2$
$+4$
$+6$
$+8$

c)

x	y
4	11
2	14
0	17
−2	20
−4	23

d)

x	y
−2	−12
−1	−5
0	0
1	3
2	4

b) i) NO

ii) A constant
change in x
does not produce
a constant change
in y.

2. Each table of values represents a **linear relation**.
   Complete each table. Explain your reasoning.

a)

x	y
1	
2	
3	14
4	18
5	

b)

x	y
1	7
3	3
5	−1
7	−5
9	−9

-4
-4
-4
-4

c)

x	y
4	9
2	14
0	19
−2	24
−4	29

5
5
5
5

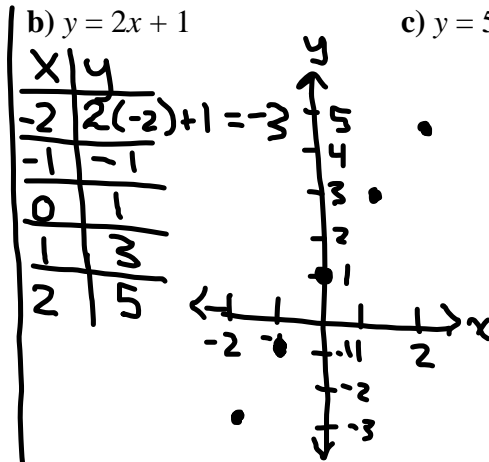**3.** Create a table of values for each linear relation and then graph the relation.
Use values of x from -2 to 2.

a) $y = x + 4$

b) $y = 2x + 1$

x	y
-2	2(-2)+1 = -3
-1	-1
0	1
1	3
2	5

c) $y = 5 - 2x$

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

a) Create a table to show the relation between the time in hours for the service call and the total cost for 1 to 5 hours.

hours n	cost C
1	80 + 50 = 130
2	80 + 2(50) = 180
3	80 + 3(50) = 230
4	280
5	330

b) Is this relation linear? Justify your answer.

Yes it is linear, because a constant change in the hours produces a constant change in the cost.

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.

$C = 50n + 80$

d) How much will a 7-h service call cost?

$C = 50(7) + 80$
$= 350 + 80$
$= \$430$