

Unit 7 Linear Relations**7.1 Representing Patterns**

Ex.



Figure 1

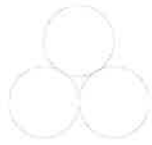


Figure 2

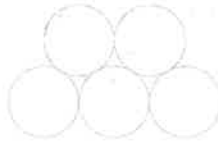


Figure 3

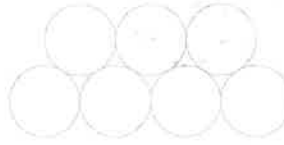


Figure 4

a) Describe the pattern.

start with 1 circle, then add 2 circles to each consecutive figure

b) Create a table of values to represent the relation between the figure number (n) and the number of circles (c). Is this a linear relation?

figure # n	# of circles c
1	1
2	3
3	5
4	7

Yes it is a linear relationship because each variable is changing by a constant amount

c) Write a linear equation to represent the pattern.

$$c = 2n - 1$$

d) How many circles are there in figure #15?

$$c = 2(15) - 1 \quad n = 15$$

$$c = 30 - 1$$

$$c = 29$$

29 circles

e) Which figure number has 61 circles?

$$c = 61$$

$$61 = 2n - 1$$

$$+1 \quad +1$$

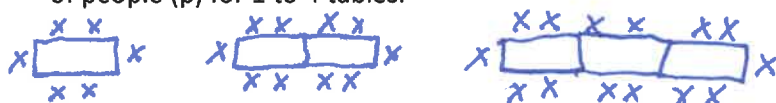
$$\frac{62}{2} = \frac{2n}{2}$$

$$31 = n$$

Figure 31

Ex. In a banquet hall a single rectangular table seats six people (two on each side and one at each end). Each time a new table is added on to the end, four more people can be seated.

- a) Create a table of values showing the relation between the number of tables (t) and the number of people (p) for 1 to 4 tables.



t	p
1	6
2	10
3	14
4	18

- b) Write a linear relation to model the situation.

$$p = 4t + 2$$

$$p = 4t + 2$$

$$14 = 4(3) + 2$$

$$= 12 + 2$$

$$14 = 14$$

- c) How many people can 13 connected tables seat?
t = 13

$$p = 4(13) + 2$$

$$= 52 + 2$$

$$p = 54$$

54 people

- d) How many tables are connected to allow seating for 114 people?

$$p = 4t + 2$$

$$114 = 4t + 2$$

$$-2 \quad -2$$

$$112 = 4t$$

$$\frac{112}{4} = \frac{4t}{4}$$

$$28 = t$$

28 tables