

# 10

## Linear Relations

### Identifying and Extending Patterns

1. Describe each pattern.

a) 15, 18, 21, 24 ...

The pattern starts with \_\_\_\_\_.

Each number is \_\_\_\_\_ the number before it.

b) 92, 87, 82, 77 ...

The pattern starts with \_\_\_\_\_.

Each number is \_\_\_\_\_ the number before it.

c) 2, 4, 8, 16 ...

The pattern starts with \_\_\_\_\_.

Each number is \_\_\_\_\_ the number before it.

2. Write the next two terms in each pattern.

a) 40, 43, 46, 49, \_\_\_\_\_, \_\_\_\_\_      c) 6, 18, 54, 162, \_\_\_\_\_, \_\_\_\_\_

b) 95, 91, 87, 83, \_\_\_\_\_, \_\_\_\_\_      d) 226, 201, 176, 151, \_\_\_\_\_, \_\_\_\_\_

### Making a Table of Values

A table of values shows how two variables are related. Here, the amount of money earned increases by \$15 for each hour worked.

The following equation shows this relationship:

$$\text{money earned} = \text{hours} \times \$15$$

Hours worked	0	1	2	3	4
Money earned	\$0	\$15	\$30	\$45	\$60

3. Complete the table of values for each relation.

a)  $y = x + 4$

x	0	1	2	3	4
y	4				

c)  $y = 2x - 3$

x	0	1	2	3	4
y					

b)  $y = x - 6$

x	0	1	2	3	4
y	-6				

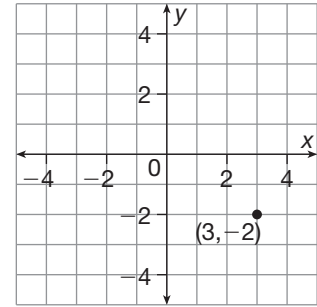
d)  $y = 4x + 3$

x	0	3	6	9	12
y					

## Plotting Patterns on a Coordinate Grid

An ordered pair is a pair of numbers that describes a point on a coordinate grid. An example is  $(3, -2)$ .

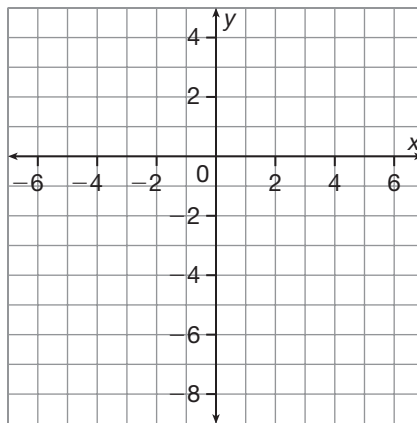
- The first number describes the distance along the horizontal axis, or  $x$ -axis.
- The second number describes the distance along the vertical axis, or  $y$ -axis.



You can plot points on a coordinate grid to show a number pattern.

- If the pattern increases or decreases by the same amount each time, the points form a straight line.
- A pattern that makes a straight line is called a linear pattern.

4. Plot each pattern on the coordinate grid below. Join the points to form a line. Use a different colour for each pattern.



a) The first point is  $(0, -2)$ .

<b>x</b>	0	1	2	3	4
<b>y</b>	-2	-1	0	1	2

b) The first point is  $(-4, -6)$ .

<b>x</b>	-4	-3	-2	-1	0
<b>y</b>	-6	-4	-2	0	2

5. Which pattern in Question 4 is growing faster?  
How do you know?