

Name ..... Class ..... Date .....

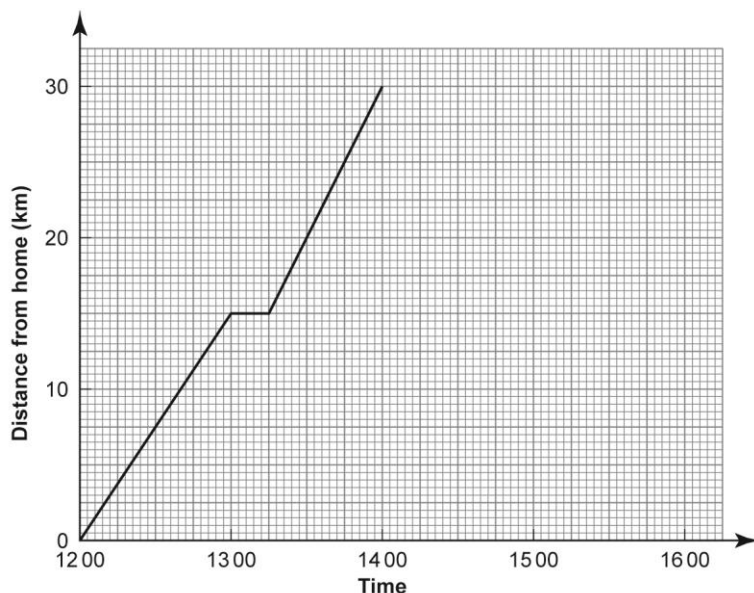
- 1 Write down: **i** the next number and **ii** the term-to-term rule for sequences **a** and **b**.  
**a** 23, 17, 11, ...      **b** 2.4, 3.7, 5.0, ...
- 2 **a** Draw  $x$ - and  $y$ -axes from  $-4$  to  $4$ .  
**b** Plot and label the points  $A(-3, 1)$ ,  $B(0, 4)$  and  $C(2, 2)$   
**c**  $ABCD$  is a rectangle. Mark point  $D$  on your diagram.  
**d** Write down the coordinates of  $D$ .
- 3 John takes  $t$  minutes to cycle to school.  
**a** It takes him three times as long to walk to school. Write down, in terms of  $t$ , how long it takes him to walk to school.  
**b** When John goes to school by bus, it takes him 10 minutes longer than when he cycles. Write down, in terms of  $t$ , how long it takes him to go to school by bus.  
**c** One week John cycles to school on two days and goes by bus on three days. Write down, in terms of  $t$ , the total time he spends travelling to school that week. Simplify your answer as far as possible.  
**d** If  $t = 14$ , use your answer to **c** find the total time that John spends travelling to school that week.
- 4 The cost, in pounds, of hiring a cement mixer is worked out using the rule:  
 multiply the number of days by 6 and add 15  
**a** Write the rule as a formula to find the cost,  $C$ , when the cement mixer is hired for  $n$  days.  
**b** Use your formula to find the cost of hiring the cement mixer for 7 days.  
**c** Geoff was charged £81 for the hire of the cement mixer. For how many days did he hire it?
- 5 Solve each of the following equations.  
**a**  $3x + 7 = 13$       **b**  $\frac{c}{2} = 8$       **c**  $5q = 2q - 12$       **d**  $6k - 13 = 4k + 5$
- 6 **a** Copy and complete this table of values for  $2x + y = 4$ 

$x$	$-2$	$0$	$3$
$y$			

  
**b** Draw the graph of  $2x + y = 4$  for values of  $x$  from  $-2$  to  $3$ .
- 7 Write down the equation of the line which goes through the points  $(3, 3)$  and  $(-5, -5)$ .
- 8 Mark thinks of a number, multiplies it by 4 and adds 3.  
 The answer is 27.  
 Write down an equation and solve it to find Mark's number.
- 9 **a** Write down all of the whole number values of  $x$ , such that  $-5 < x \leq 3$   
**b** Represent the inequality  $-5 < x \leq 3$  on a number line.
- 10 The  $n$ th term of a sequence is  $7n - 3$   
 Write down the first three terms of the sequence.
- 11 Factorise:  
**a**  $12a + 8b$       **b**  $xy - 2x$       **c**  $2k^2 + 6k$       **d**  $3pq^2 - 12p^2r$

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**12** Ranvir goes for a cycle ride. The distance–time graph shows her ride.



She sets off from home at 12:00 and has a flat tyre at 14:00.  
During her ride she stops for a rest.

- a** **i** At what time does Ranvir stop for a rest?  
**ii** At what speed does she travel before her rest?

It takes Ranvir 30 minutes to repair the flat tyre. She then cycles home at 20 km per hour.

- b** Copy the distance–time graph and complete it to show Ranvir's journey home.

**13** Remove the brackets and then simplify:

**a**  $3(5x + y) + 2(3y - 2x)$       **b**  $5(2m + 3) - 3(4 - m)$

**14** Here are the first five numbers of a sequence:

3, 9, 15, 21, 27

- a** Write down the next two numbers in the sequence.  
**b** Write down, in words, the term-to-term rule to continue this sequence.  
**c** Write down an expression for the  $n$ th term of this sequence.  
**d** What will the 20th term of the sequence be?

**15** Solve the inequality  $6y - 4 \leq 2y + 7$

**16** Solve the following equations:

**a**  $4(a + 3) = 6(a - 1)$       **b**  $\frac{x+1}{2} - \frac{2x-3}{5} = 1$

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**17** Starting with  $x = 4$ , use a trial and improvement method to find, correct to one decimal place, a solution to the equation  $x^3 + x = 84$

Show all your working.

**18 a** Copy and complete the table for  $y = x^2 - 2x - 2$

$x$	-2	-1	0	1	2	3	4
$y$	6		-2			1	

- b** Draw  $x$ - and  $y$ -axes with the  $x$ -axis from -2 to 4 and the  $y$ -axis from -4 to 6.  
On the axes, draw the graph of  $y = x^2 - 2x - 2$  for values of  $x$  from -2 to 4.
- c** Write down the equation of the line of symmetry of the graph.
- d** Write down the coordinates of the minimum point on the graph.
- e** Use your graph find the values of  $x$  when  $y = 0$ .