



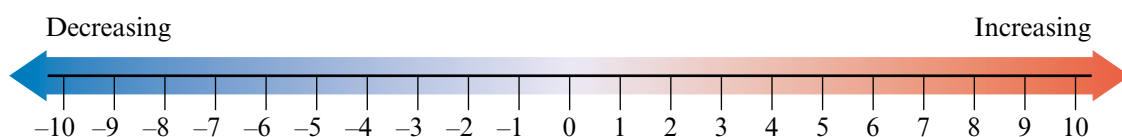
Negative numbers

- Using a number line for positive and negative numbers
- Adding and subtracting negative numbers

Keywords

You should know

explanation 1



1 Use the number line to help you find the missing terms in these sequences.

a 4, 2, 0, , ,

b 5, 3, 1, , ,

c 6, 3, 0, , ,

d -3, -1, 1, , ,

e -4, -2, 0, , ,

f 8, 5, , , -4,

g 10, , 4, , -2,

h -9, , -1, , 7,

i -5, , 0, , , 7.5

2 Describe each of the sequences in question 1 as either increasing or decreasing.

3 Write these numbers in order of size, smallest first.

a 4, 7, -3, 0, -2, -5

b 6, -4, -10, 3, -5, 0

c 0, 2, -1, -9, -3, -6

d 2.3, -1, -3, -4.2, -3.8

e -1.2, -0.7, 0.1, 7.2, -2

f 1, -7.2, -1.8, -3, -1.75

4 Copy and complete. Use the symbols $<$ and $>$ to compare these pairs of numbers.

$<$ means 'is less than'
 $>$ means 'is greater than'

a $-6 \square -3$

b $0 \square -2$

c $-7 \square -10$

d $-1 \square 8$

e $-31 \square -20$

f $-15 \square -19$

g $-5.2 \square -5$

h $-4.9 \square -5$

5 Increase each of these numbers by 5.

a 7

b -2

c -8

d -5

e -9

f -1

g -20

h -100

6 Decrease each of these numbers by 7.

a 11

b 3

c 0

d 2

e -1

f -4

g -30

h -50

7 One morning in March, the outside temperature was -3°C . By midday this had risen to 12°C . By how much had the temperature increased?

8 On a cold day, wind chill can make it *feel* even colder. If the wind chill is -10°C , then a temperature of 4°C would feel like -6°C . What does each of these temperatures feel like with a wind chill of -10°C ?

a 1°C

b 3°C

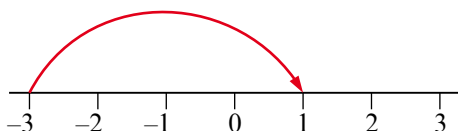
c -2°C

d -15°C

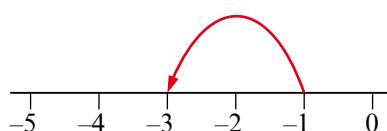
explanation 2

9 Write down the calculation represented by each diagram.

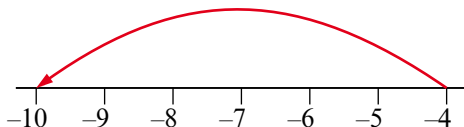
a



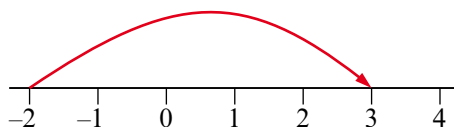
b



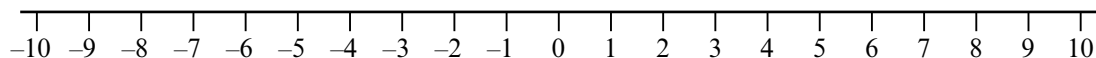
c



d



10 Work out the calculations, using the number line.



a $3 - 8$

b $-9 + 7$

c $-3 - 6$

d $-8 + 1$

e $-10 + 10$

f $-5 + 15$

g $-3 + 11$

h $-6 + 12$

11 Work out the following calculations.

a $-7 + 3 + 1$

b $-9 + 5 + 7$

c $2 - 6 - 4$

d $-10 + 5 + 9$

12 Add 6 to each of the numbers, using the number line.

a 2.5

b -0.5

c -3.5

d -7.5

13 Subtract 4 from each of these numbers.

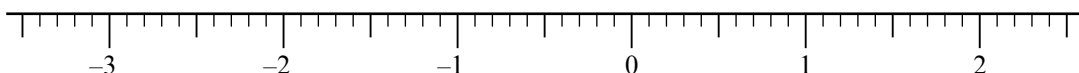


a 3.5 **b** 1.5 **c** -2.5 **d** -5.5

14 Add 7.5 to each of these numbers.

a -3 **b** -1 **c** -8 **d** -10
e -2.5 **f** -5.5 **g** -7.5 **h** -9.5

15 Use the number line to help you find these values.



a -2 is decreased by 0.4 **b** -3 is increased by 0.2
c -1 is decreased by 0.9 **d** 0.3 is added to -1
e 1.1 is subtracted from -2 **f** 2 is added to -0.4

16 Copy and complete these calculations.

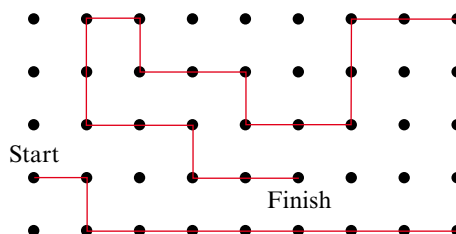
a $-6 + \square = 3$ **b** $2 - \square = -8$ **c** $-1 + \square = 6$ **d** $-3 \square \square = -7$
e $-5 \square \square = 3$ **f** $-7 \square \square = -10$ **g** $-2 \square \square = -6$ **h** $-4 \square \square = 1$
i $\square + 8 = 7$ **j** $\square - 6 = -4$ **k** $\square + 5 = -4$ **l** $\square - 9 = -10$

explanation 3

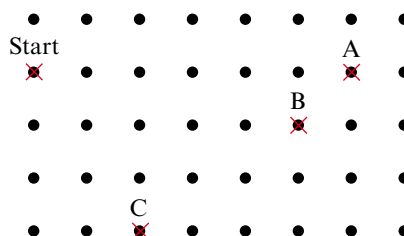
17 Copy and complete the table to show two sets of equivalent instructions.

Instruction using positive numbers	Instruction using negative numbers
Move 3 places to the left	
	Move -5 places up
	Increase by -3
	Move -8 places to the right
Decrease by 4	

- 18** The diagram shows the path taken by a robot. The first two stages can be described as **right 1, up -1** . Describe the remaining stages in the same way, without using left or down.



- 19 a** Copy the diagram and draw the path described by these instructions.
right 3, up 1, right 1, up -3 , right 2,
up 1, right 1, up -2 , right -4 , up 2,
right -1 , up -2



- b** Which of the points A, B or C is the finish point?

- 20** Rewrite the following statements without using negative numbers.

- a** The ship travelled -50 miles north.
- b** In the evening, the temperature rose by -8°C .
- c** As the plane approached the airport, it gained -5000 ft in height.
- d** The car that Peter bought last year is now worth $-\pounds 3200$ more.
- e** The population of the UK has fallen by -10 million since 1950.

explanation 4a

explanation 4b

- 21** Copy and complete the following statements.

- a** Adding -4 is the same as ...
c $1 + -4 = 1 \square 4 = \square$
e ... is the same as adding 9.
g $-3 - \square = -3 + 9 = \square$
- b** Subtracting -10 is the same as ...
d $16 - -10 = 16 \square 10 = \square$
f ... is the same as subtracting 5.
h $2 + \square = 2 - 5 = \square$

- 22** Work out these calculations.

- | | | | | | | | |
|----------|-----------|----------|----------|----------|-------------|----------|--------------|
| a | $-2 + -6$ | b | $4 - -5$ | c | $-3 - -3$ | d | $-4 - -7$ |
| e | $8 + -9$ | f | $0 - -4$ | g | $-10 + -1$ | h | $-12 - -13$ |
| i | $-3 - -2$ | j | $5 + -6$ | k | $10 + -0.5$ | l | $3.5 - -0.5$ |

a $-5 - -7 = -5 \square 7 = \square$

b $3 + -10 = 3 \square 10 = \square$

c $-8 \square -9 = -8 \square 9 = 1$

d $5 + \square = 5 - \square = -6$

e $-4 \square - 3 = -4 \square 3 = -7$

f $\square + -8 = -10$

g $\square - -9 = -1$

h $-6 + \square = -11$

24 Copy and complete these addition and subtraction grids.

a	+	-7	3	0	
		-11			
	-2				-6
	0				
			-2		

-	-1	-3		6
5	6			
-3			-8	
	0			
-7				

c

-	2	4	-6	
-3	-5			
2				
	-3			
-5				-4

+	1	-4	-1	
	-3			-7
-5				
-2				
				-9

25 In a magic square, each row, column and diagonal has the same total. Copy and complete these two magic squares.

a

2	0	-7	9
	5		-2
	-6		
-3		6	

b

7			-6
		-1	4
-2	3		
0		6	-5

26 Copy and complete these addition pyramids.

a

Diagram illustrating a pyramid structure with 5 rows of boxes. The values in the boxes are:

- Row 1: -10
- Row 2: (empty), (empty)
- Row 3: (empty), (empty), (empty)
- Row 4: -4 , -1 , (empty)
- Row 5: -3 , -1 , (empty), -6 , (empty)

b

					-8		1																	
								-5																
										-10														
														-4										

27 a Find two numbers that have a sum of 4 and a difference of 10.

b Find three consecutive numbers that total -12 .

c If $20 + x < 20$, what can you say about x ?