

**Pack B**

# Paper 2: reasoning

**Worked answers**

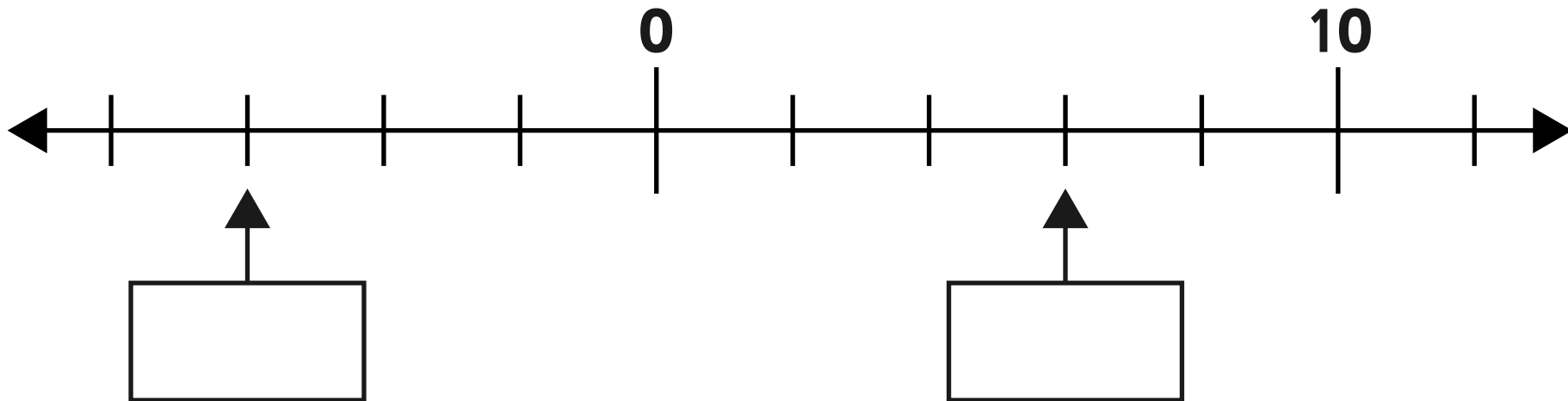




1

Here is part of a number line.

Write the missing numbers in the boxes.

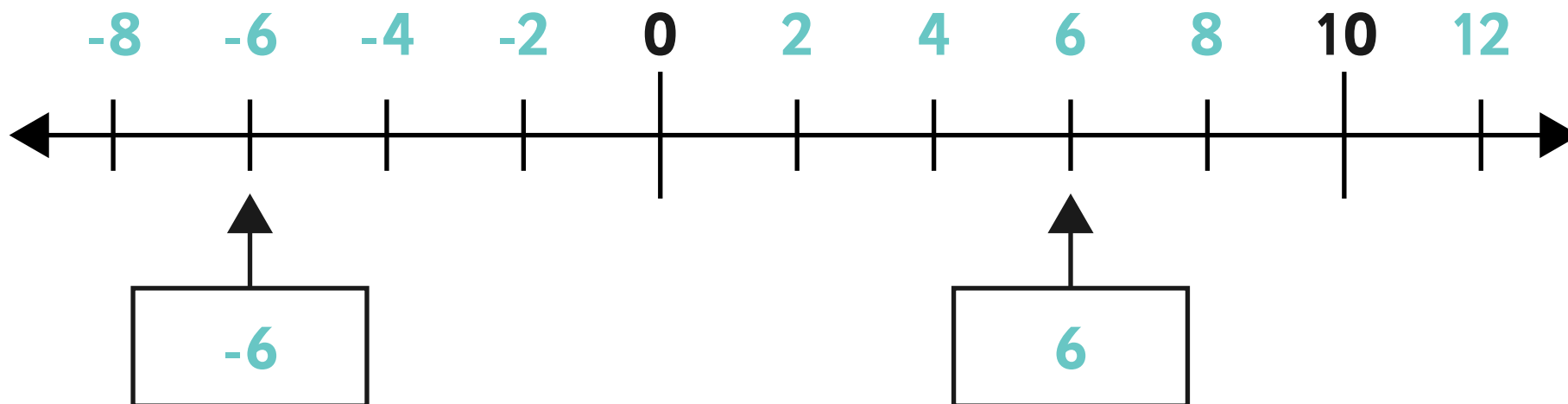




1 Here is part of a number line.

Write the missing numbers in the boxes.

Each interval is 2





2

Books are sold in boxes of 8.

There are 30 children in Year 6. Each child needs 1 book.

How many boxes must they buy?

Bookmarks are sold in packs of 12.

Year 6 buy 3 packs.

How many bookmarks will they have left over?





2

Books are sold in boxes of 8.

There are 30 children in Year 6. Each child needs 1 book.

How many boxes must they buy?

1 box of 8 = 8

2 boxes of 8 = 16

3 boxes of 8 = 24

4 boxes of 8 = 32

To have enough for 30 children,  
they must buy 4 boxes of books.

4

Bookmarks are sold in packs of 12.

Year 6 buy 3 packs.

How many bookmarks will they have left over?

$12 \times 3 = 36$

So, they have 36 bookmarks altogether.

There are 30 children.

$36 - 30 = 6$

6





3

Amy buys one bunch of sunflowers and one bunch of daffodils.

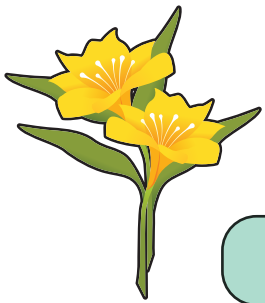
She pays with a £5 note.

How much change does Amy get?



£1.45

**sunflowers**



£1.20

**daffodils**

£



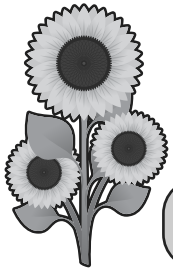


3

Amy buys one bunch of sunflowers and one bunch of daffodils.

She pays with a £5 note.

How much change does Amy get?

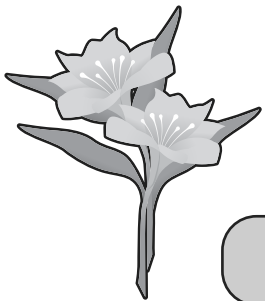


£1.45

sunflowers

Sunflowers = £1.45  
Daffodils = £1.20

	1	4	5
+	1	2	0
	2	6	5



£1.20

daffodils

Change from £5

	4	5	10
+	2	6	5
	2	3	5

£ 2.35





4

Shen is working out how long he spends on homework every week.

From Monday to Friday, he does homework from 7:30am to 8:00am and from 3:50pm to 4:45pm.

He does no homework at the weekend.

What is the **total** time Shen spends on his homework every week?

Show  
your  
method

**hours**      **minutes**

**hours**      **minutes**

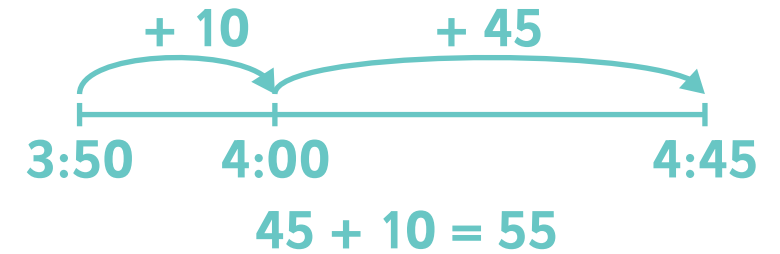


4

Shen is working out how long he spends on homework every week.

From Monday to Friday, he does homework from 7:30am to 8:00am and from 3:50pm to 4:45pm.

He does no homework at the weekend.



What is the **total** time Shen spends on his homework every week?

Show  
your  
method

7:30 to 8:00 = 30 minutes

3:50 to 4:45 = 55 minutes

30 + 55 = 85 minutes a day

$$\begin{array}{r} 007r5 \\ 60 \overline{) 425} \end{array}$$

Monday to Friday = 5 days

85 x 5 = 425 minutes

425 ÷ 60 = 7 r 5

= 7 hours and 5 minutes

**7 hours 5 minutes**





5

The vertices of a quadrilateral have these coordinates.

$(2, 7)$

$(-1, 3)$

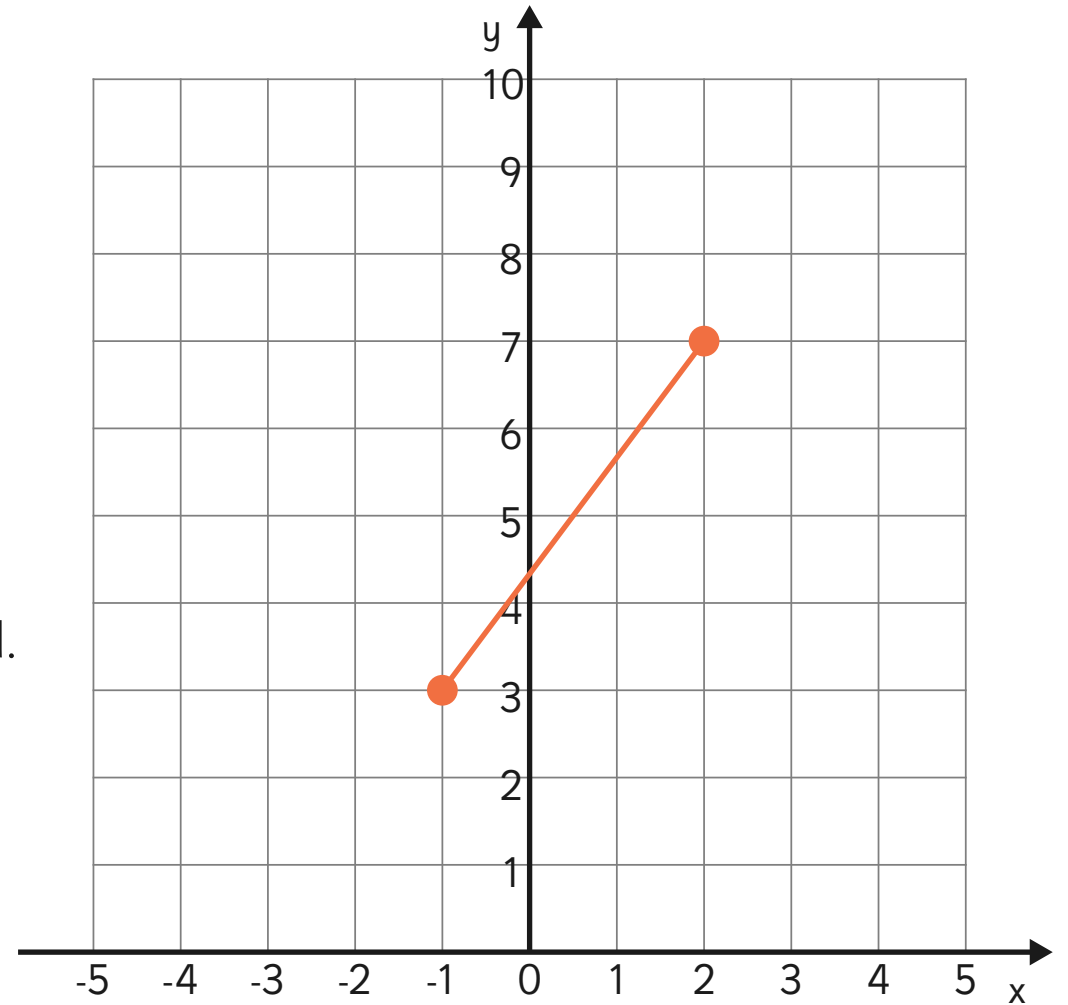
$(-4, 7)$

$(-1, 9)$

Complete the quadrilateral.

One side of the quadrilateral has been drawn on the grid.

Use a ruler.





5

The vertices of a quadrilateral have these coordinates.

$(2, 7)$

$(-1, 3)$

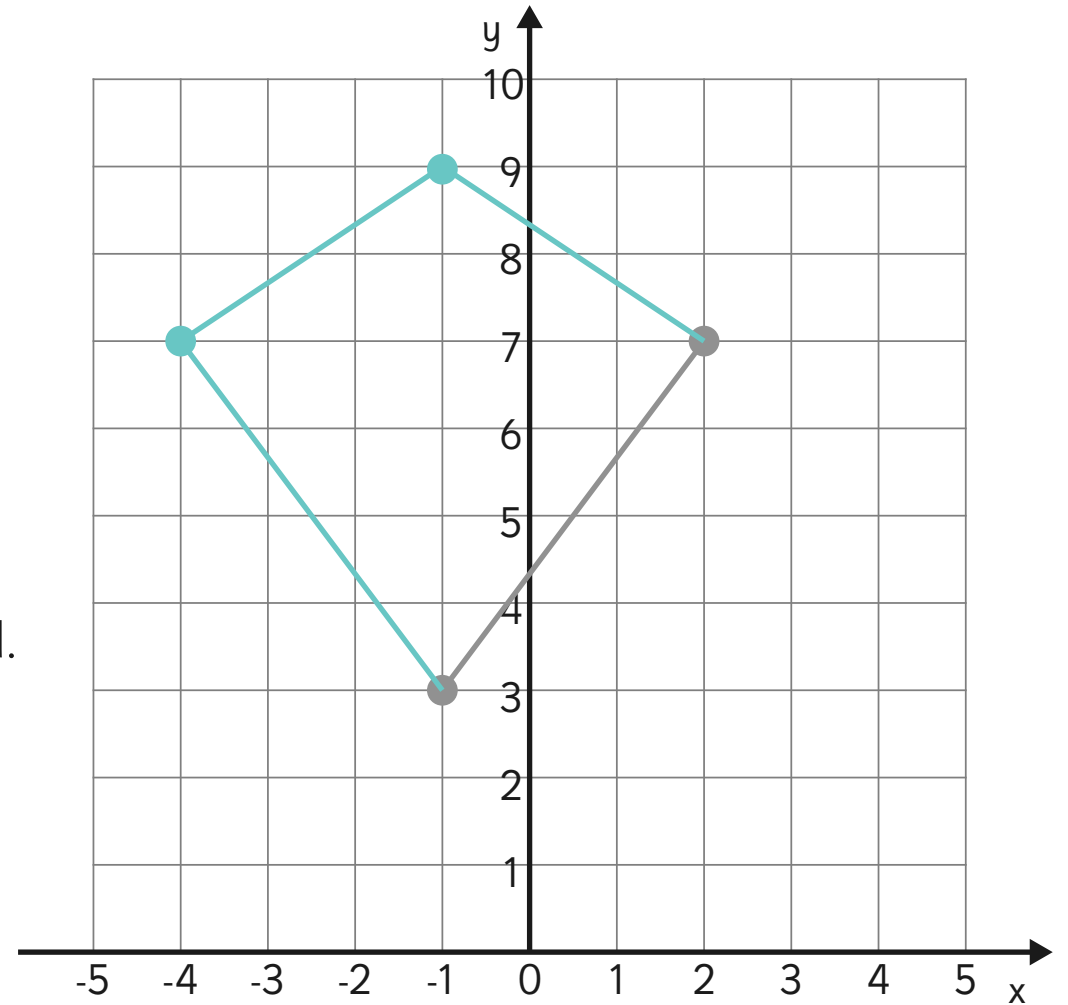
$(-4, 7)$

$(-1, 9)$

Complete the quadrilateral.

One side of the quadrilateral has been drawn on the grid.

Use a ruler.

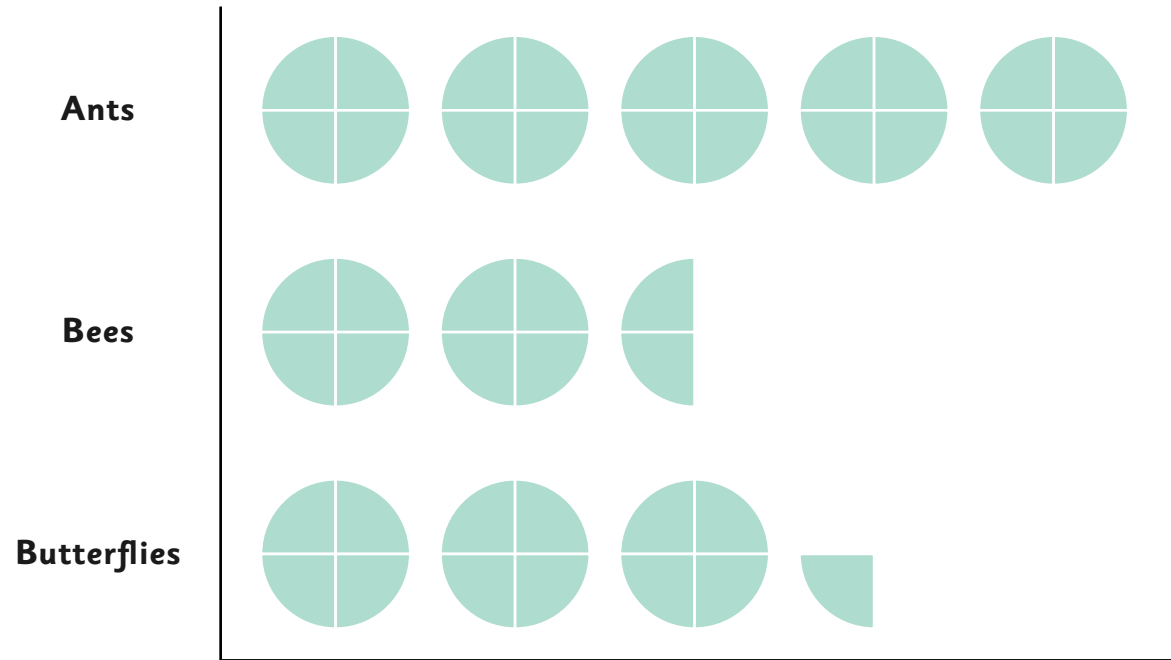
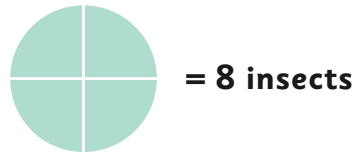




6

Inaya is looking for insects in her garden.

She makes a pictogram to show the different insects she found.



How many more butterflies  
did she see than bees?





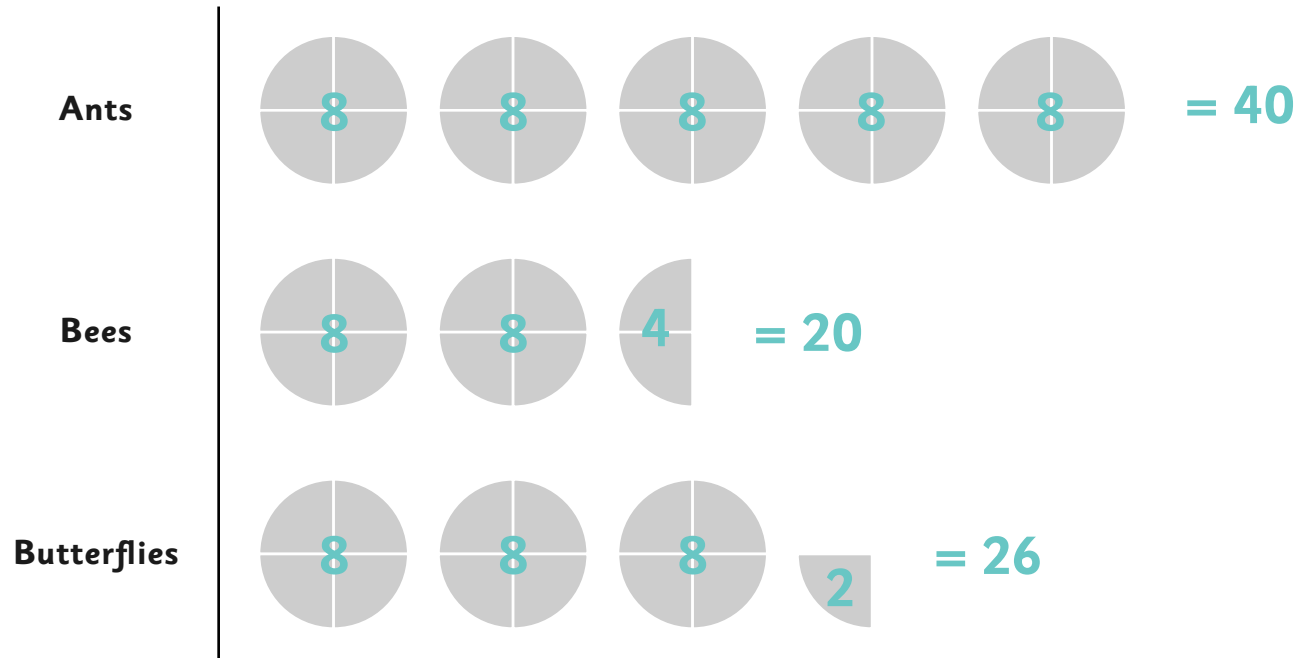
6

Inaya is looking for insects in her garden.

She makes a pictogram to show the different insects she found.



How many more butterflies  
did she see than bees?



$$26 - 20 = 6$$

6

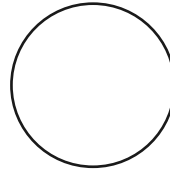




**7**

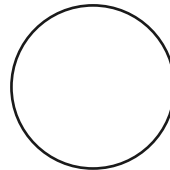
Write the symbol  $<$ ,  $>$  or  $=$  in each box to make the statements correct.

$4 \times 8$



$35 - 5$

$48 \div 8$



$3 + 3$



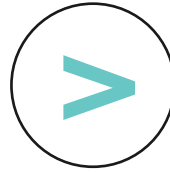


**7**

Write the symbol  $<$ ,  $>$  or  $=$  in each box to make the statements correct.

$4 \times 8 = 32$

$4 \times 8$

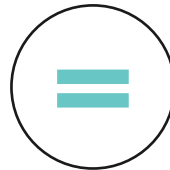


$35 - 5 = 30$

$35 - 5$

$48 \div 8 = 6$

$48 \div 8$



$3 + 3 = 6$

$3 + 3$

$>$  means greater than

$<$  means less than

$=$  means equal to





**8**

Here is part of a number sequence.

The numbers decrease by the same amount each time.

**250**

**215**

**180**

**145**

**110**

Circle all the numbers below that would appear in the sequence.

**-30**

**75**

**10**

**40**

**95**





8

Here is part of a number sequence.

The numbers decrease by the same amount each time.

$$\begin{array}{r} 1 \ 4 \ 5 \\ - \ 1 \ 1 \ 0 \\ \hline 3 \ 5 \end{array}$$



Circle all the numbers below that would appear in the sequence.

-30

75

10

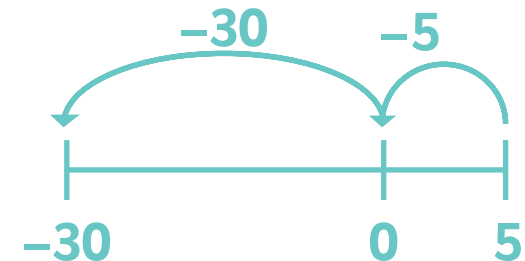
40

95

$$\begin{array}{r} 1 \ 1 \ 0 \\ - \ 3 \ 5 \\ \hline 7 \ 5 \end{array}$$

$$\begin{array}{r} 7 \ 5 \\ - \ 3 \ 5 \\ \hline 4 \ 0 \end{array}$$

$$\begin{array}{r} 4 \ 0 \\ - \ 3 \ 5 \\ \hline 0 \ 5 \end{array}$$





9

Tick the numbers that round to **three million** when rounded to the nearest million.

3,104,251

☐

2,711,150

☐

2,116,000

☐

3,365,210

☐

3,901,000

☐



9

Tick the numbers that round to **three million** when rounded to the nearest million.

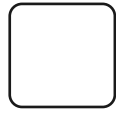
3,104,251



2,711,150



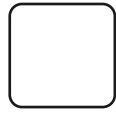
2,116,000



3,365,210



3,901,000



Rounding to 1,000,000 - will the millions digit change?

We need to look at the hundred thousands digit.

If it is 5 or greater, then we round the millions digit up.

If it is 4 or less, then the millions digit stays the same.





10

Write the number that is **ten thousand more** than 490,321?

Write the number that is **one thousand less** than 490,321?





10

Write the number that is **ten thousand more** than 490,321?

$$\begin{array}{r}
 490321 \\
 + \quad 10000 \\
 \hline
 500321 \\
 \hline
 1
 \end{array}$$

500,321

Write the number that is **one thousand less** than 490,321?

$$\begin{array}{r}
 490321 \\
 - \quad 1000 \\
 \hline
 489321 \\
 \hline
 \end{array}$$

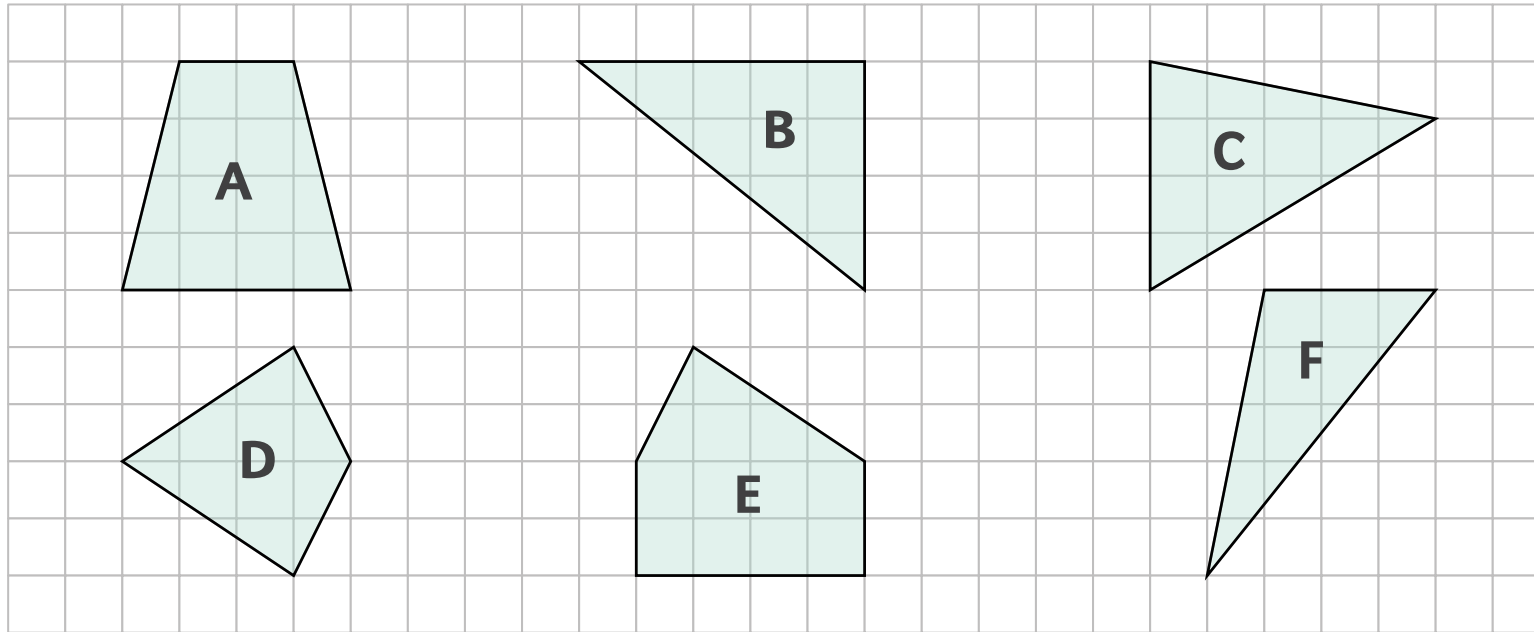
489,321





11

Here are some shapes drawn on a square grid.



Write the letters of two shapes which have a line of symmetry.

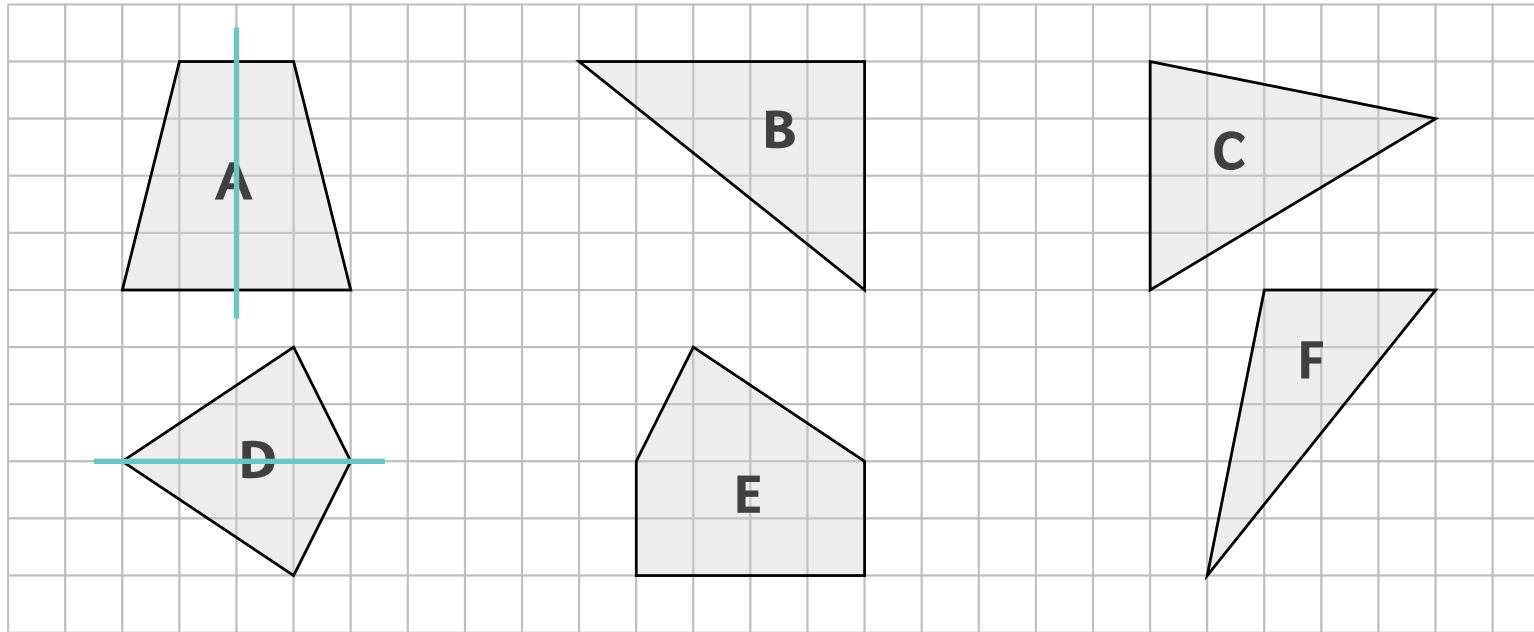
\_\_\_\_\_ and \_\_\_\_\_





11

Here are some shapes drawn on a square grid.



Write the letters of two shapes which have a line of symmetry.

    A     and     D    





12

Circle the two fractions below that are equivalent.

$$\frac{1}{2}$$

$$\frac{2}{3}$$

$$\frac{4}{12}$$

$$\frac{3}{4}$$

$$\frac{1}{3}$$

$$\frac{5}{12}$$





12

Circle the two fractions below that are equivalent.

$$\frac{1}{2}$$

In its  
simplest  
form

$$\frac{2}{3}$$

In its  
simplest  
form

$$\frac{4}{12}$$

$$\frac{1}{3}$$

$$\frac{3}{4}$$

In its  
simplest  
form

$$\frac{1}{3}$$

In its  
simplest  
form

$$\frac{5}{12}$$

In its  
simplest  
form

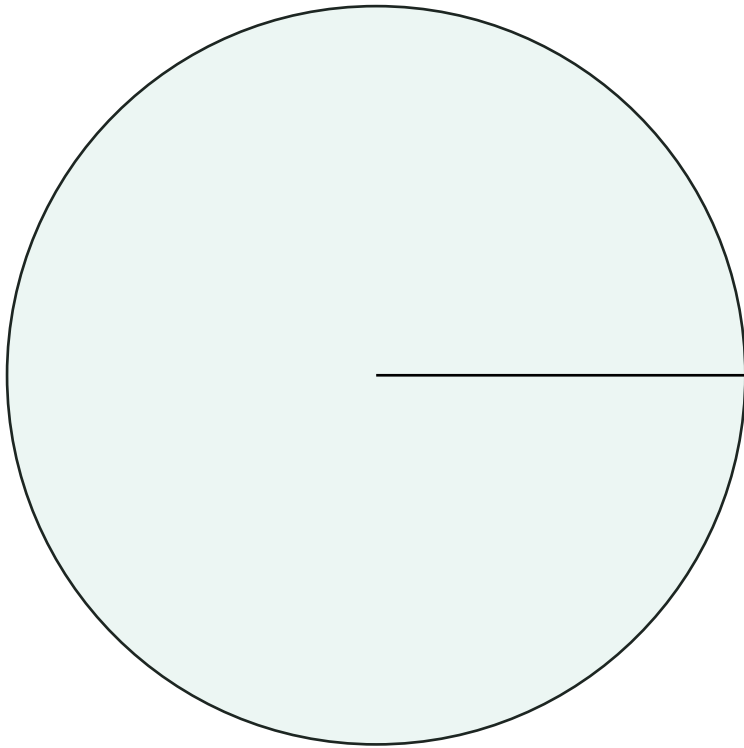




13

This diagram below shows a circle.

The distance from the centre to the edge of the circle is 14cm.



What is the diameter of the circle?

cm

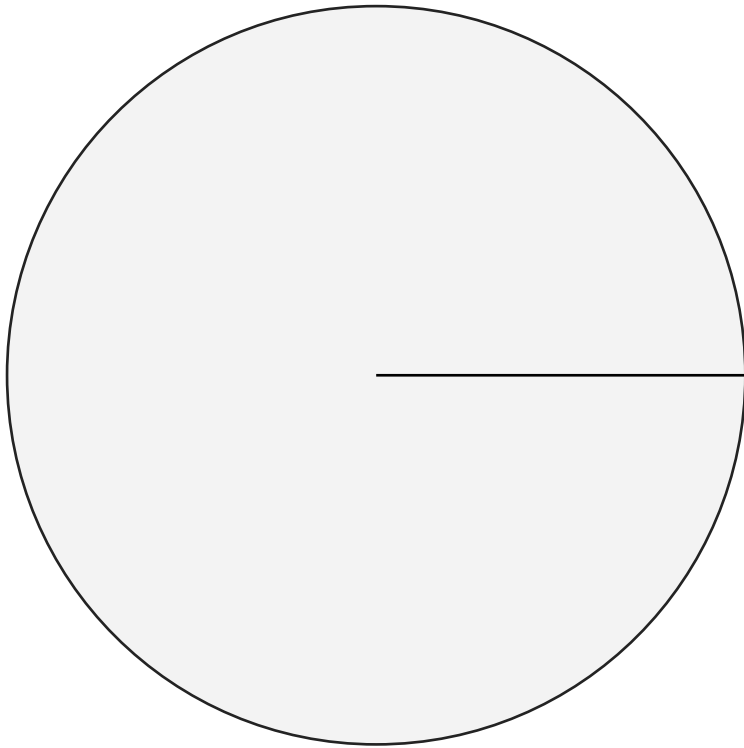




13

This diagram below shows a circle.

The distance from the centre to the edge of the circle is 14cm.



What is the diameter of the circle?

**Radius is the distance from the centre to the outside edge.**

**Diameter = radius x 2**  
**14 x 2 = 28 cm**

cm





14

At a restaurant, 8 pizzas cost £128.  
Each pizza costs the same.

How much would 11 pizzas cost?

Show  
your  
method

£





14

At a restaurant, 8 pizzas cost £128.

Each pizza costs the same.

How much would 11 pizzas cost?

Show  
your  
method

8 pizzas cost £128

1 pizza costs £16

11 pizzas cost

16



1	1
---	---

1 | 6

1 6 0

1 7 6

**£** 176

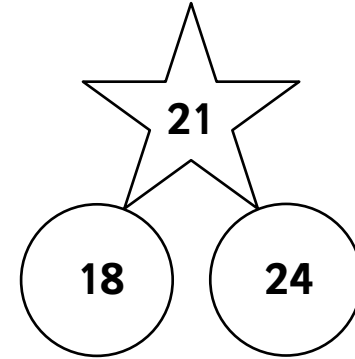
176



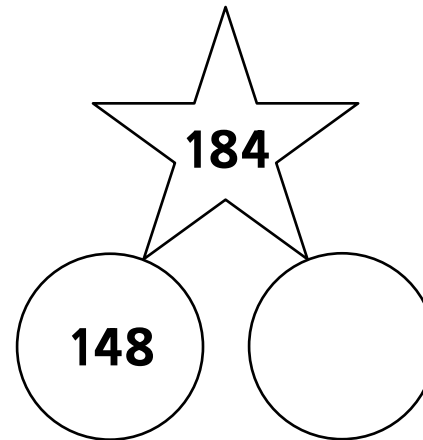
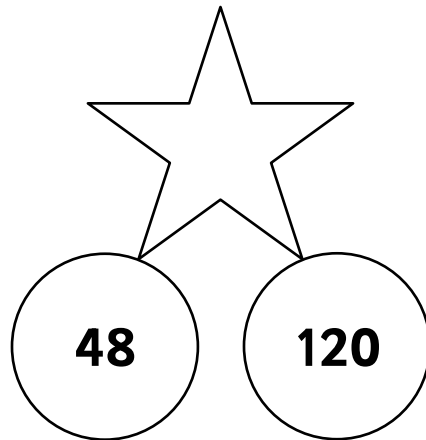
15

The diagram below follows the rule:

**“The star is found by halving the sum of the circles.”**



Use the information above to fill in the missing numbers.





15

The diagram below follows the rule:

**“The star is found by halving the sum of the circles.”**

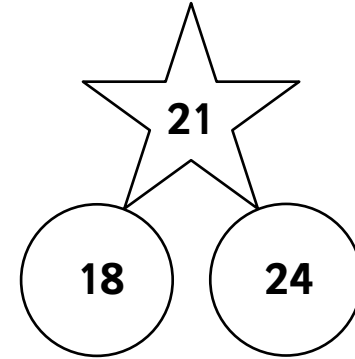
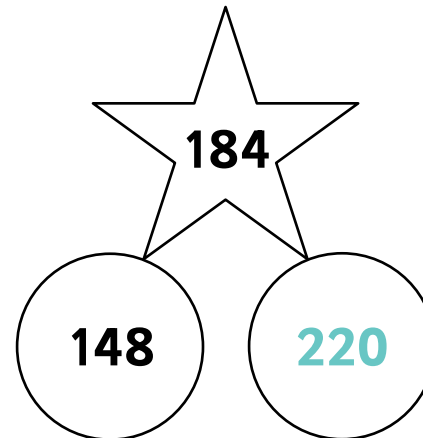
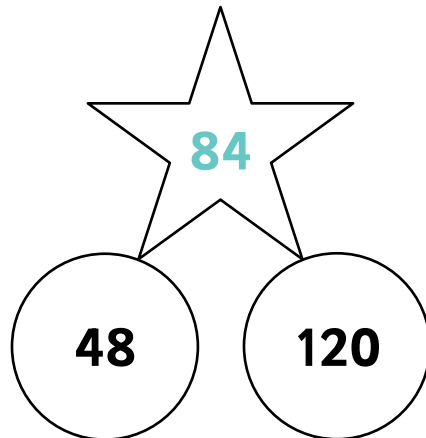
Sum = addition

Half = divide by 2

Use the information above to fill in the missing numbers.

$$\begin{array}{r} 120 \\ + \quad 48 \\ \hline 168 \end{array}$$

$$\begin{array}{r} 084 \\ 2 \overline{)168} \end{array}$$



Inverse of divide by 2 = multiply by 2

$$\begin{array}{r} 184 \\ \times \quad 2 \\ \hline 368 \\ \hline 1 \end{array}$$

Inverse of addition = subtraction

$$\begin{array}{r} 368 \\ - 148 \\ \hline 220 \\ \hline \end{array}$$





16

Here is a rule for the cost of a taxi journey.

$$\text{Cost} = 70\text{p for each mile} + \text{£}4.50$$

A journey is 5 miles.

How much does it cost?

£





16

Here is a rule for the cost of a taxi journey.

$$\text{Cost} = 70\text{p for each mile} + \text{£}4.50$$

A journey is 5 miles.

How much does it cost?

$$5 \text{ miles} = 70\text{p} \times 5$$

$$\begin{aligned} 7 \times 5 &= 35 \\ 70 \times 5 &= 350\text{p} = \text{£}3.50 \end{aligned}$$

$$\text{£}3.50 + \text{£}4.50 = \text{£}8.00$$

£ 8.00





17

One box can hold 21 oranges.

How many boxes are needed to hold 252 oranges?





**17**

One box can hold 21 oranges.

How many boxes are needed to hold 252 oranges?

1 box holds 21 oranges

OR

$3 \times 7 = 21$

$$\begin{array}{r} 012 \\ 21 \overline{)252} \\ - 21 \phantom{00} \\ \hline 42 \\ 42 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 84 \\ 3 \overline{)252} \end{array}$$

$$\begin{array}{r} 12 \\ 7 \overline{)84} \end{array}$$

12





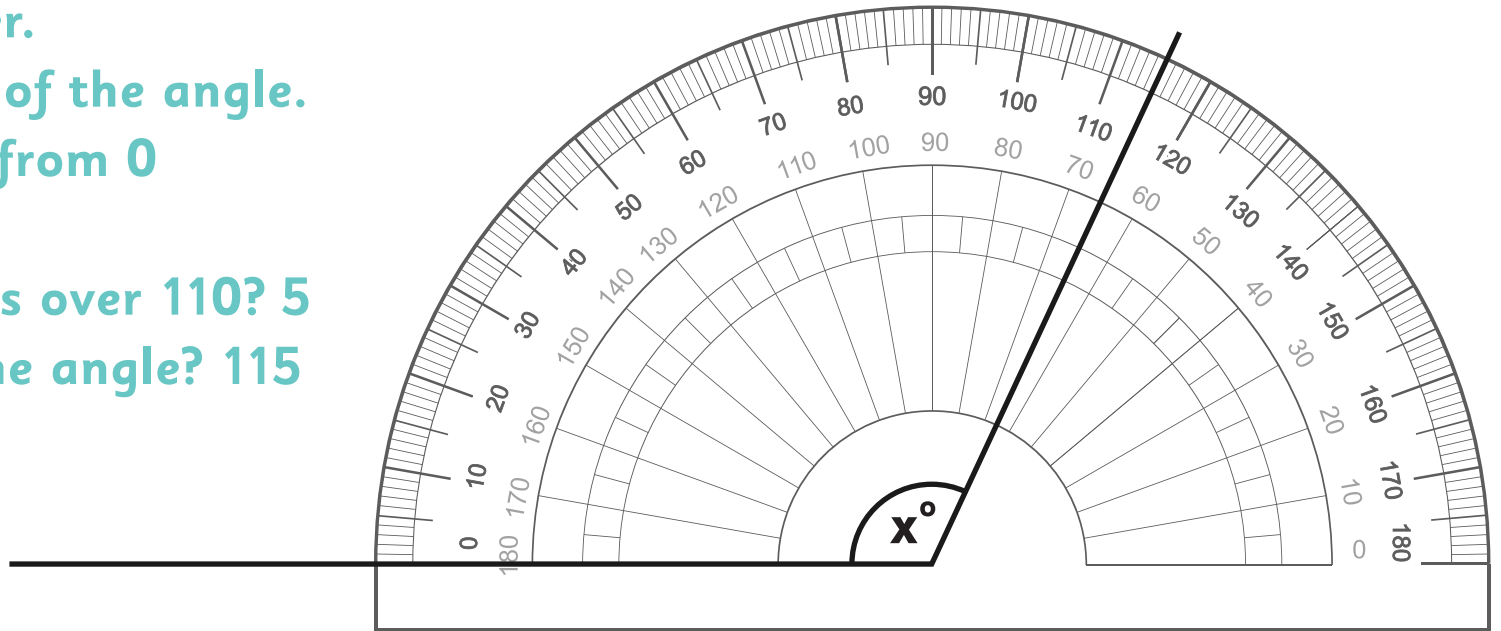


Measure angle  $x$ .

0



Use your angle measurer.  
Line 0 up with one side of the angle.  
Make sure you read up from 0  
Count up in 10s to 110  
How many more degrees over 110? 5  
How many degrees is the angle? 115



Measure angle  $x$ .

115°

Accept answers in the  
range 113 to 117 inclusive.



19

Here are three fraction cards.

$$\frac{2}{3}$$

$$\frac{1}{2}$$

$$\frac{3}{4}$$

Place each card below to make this statement correct.

>

>





19

Here are three fraction cards.

Write as decimals

0.66

0.5

0.75

OR

Write as fractions  
with the same  
denominator

$$\frac{2}{3}$$

$$\frac{1}{2}$$

$$\frac{3}{4}$$

$$\frac{8}{12}$$

$$\frac{6}{12}$$

$$\frac{9}{12}$$

Place each card below to make this statement correct.

$$\frac{3}{4}$$

>

$$\frac{2}{3}$$

>

$$\frac{1}{2}$$





20

Circle the improper fraction equivalent to  $2\frac{4}{5}$ .

$$\frac{24}{5}$$

$$\frac{6}{5}$$

$$\frac{14}{5}$$

$$\frac{26}{5}$$

$$\frac{12}{5}$$

$$\frac{28}{5}$$





20

Circle the improper fraction equivalent to  $2\frac{4}{5}$ .

$$\frac{24}{5}$$

$$\frac{6}{5}$$

$$\frac{14}{5}$$

$$\frac{26}{5}$$

$$\frac{12}{5}$$

$$\frac{28}{5}$$

$$2 \times 5 = 10$$

$$10 + 4 = 14$$

Numerator is 14

Denominator stays the same

$$\frac{14}{5}$$





21

Amy builds a tower with 3 blue blocks and 5 yellow blocks.

What fraction of her tower is blue? Give your answer in its simplest form.

Amy adds one more blue block and one more yellow block to her tower.

What fraction of her tower is now blue? Give your answer in its simplest form.





**21**

Amy builds a tower with 3 blue blocks and 5 yellow blocks.

What fraction of her tower is blue? Give your answer in its simplest form.

**3 + 5 = 8 blocks altogether**

**3 blue blocks**

**8 blocks altogether**

**$\frac{3}{8}$**

Amy adds one more blue block and one more yellow block to her tower.

What fraction of her tower is now blue? Give your answer in its simplest form.

**Blue blocks = 3 + 1 = 4**

**Yellow blocks = 5 + 1 = 6**

**4 + 6 = 10 blocks altogether**

**4 blue blocks**

**10 blocks altogether**

**$\frac{4}{10} = \frac{2}{5}$**

**$\frac{2}{5}$**





**22** Abdul is thinking of a number.

He says,

**“14% of my number is 168.”**

What is Abdul's number?





22

Abdul is thinking of a number.

He says,

**“14% of my number is 168.”**

What is Abdul's number?

$$14\% = 168$$

$$1\% = 12$$

$$100\% = 1,200$$

$$\begin{array}{r} 012 \\ 14 \overline{) 168} \\ \underline{- 14} \phantom{0} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

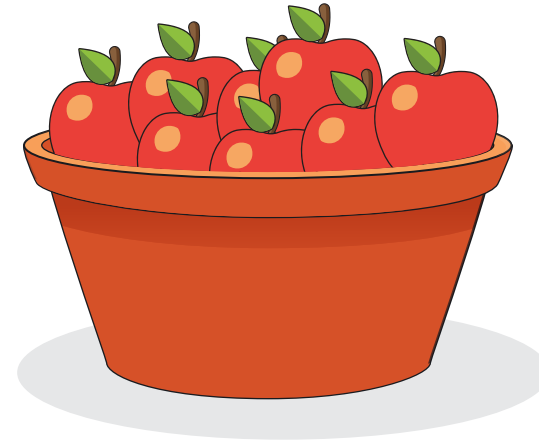
1,200





23

Sarah has a bowl of apples.  
The bowl itself weights 250 g.  
Altogether they weigh 1.27 kg.  
There are 12 apples.



What is the mass of one apple?

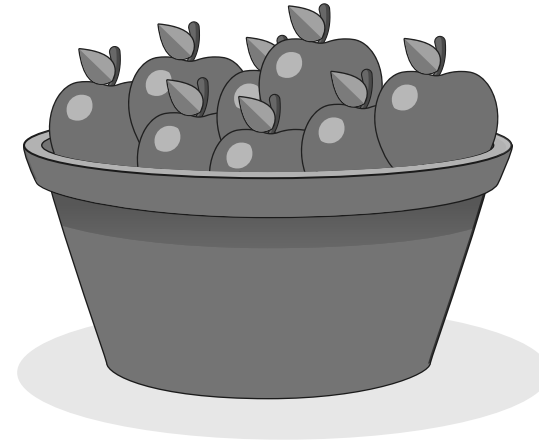
9





23

Sarah has a bowl of apples.  
The bowl itself weights 250 g.  
Altogether they weigh 1.27 kg.  
There are 12 apples.



What is the mass of one apple?

**Total weight:**

$$1.27 \text{ kg} = 1,270 \text{ g}$$

**Weight without bowl:**

$$1,270 - 250 = 1,020 \text{ g}$$

**Weight of 12 apples: 1,020g**

**Weight of 1 apple:  $1,020 \div 12 =$**

$$\begin{array}{r} 0 \quad 0 \quad 8 \quad 5 \\ 12 \overline{) 1020} \\ \underline{12} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \\ \underline{0} \phantom{0} \\ 0 \phantom{0} \end{array}$$

**85      9**

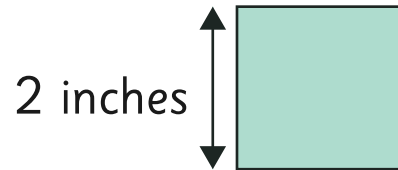




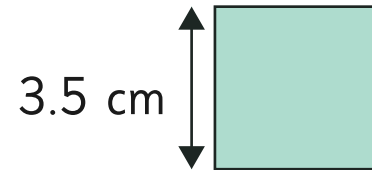
**24** Ben and Nadia are building towers out of blocks.

What is the difference in height between their towers in cm?

Ben uses these blocks:



Nadia uses these blocks:



Use  $2.5\text{cm} \approx 1 \text{ inch}$

This is Ben's tower.



This is Nadia's tower.



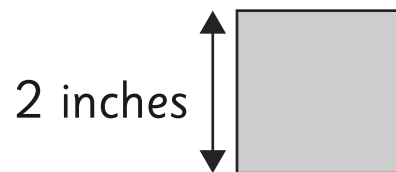
cm



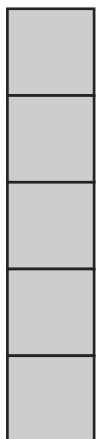


**24** Ben and Nadia are building towers out of blocks.

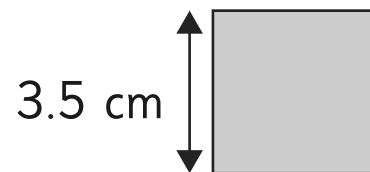
Ben uses these blocks:



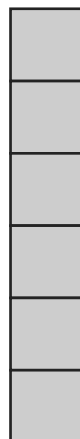
This is Ben's tower.



Nadia uses these blocks:



This is Nadia's tower.



What is the difference in height between their towers in cm?

Use  $2.5\text{cm} \approx 1 \text{ inch}$

Ben's block in cm

	inch	cm
x2	1	2.5
	2	5

Ben's block is 5 cm

Ben's tower

$$5 \times 5 = 25 \text{ cm}$$

Nadia's tower

$$\begin{array}{r} 3.5 \\ \times \quad 6 \\ \hline 21.0 \end{array}$$

$$\text{Difference in height: } 25 - 21 = 4 \text{ cm}$$

4 cm

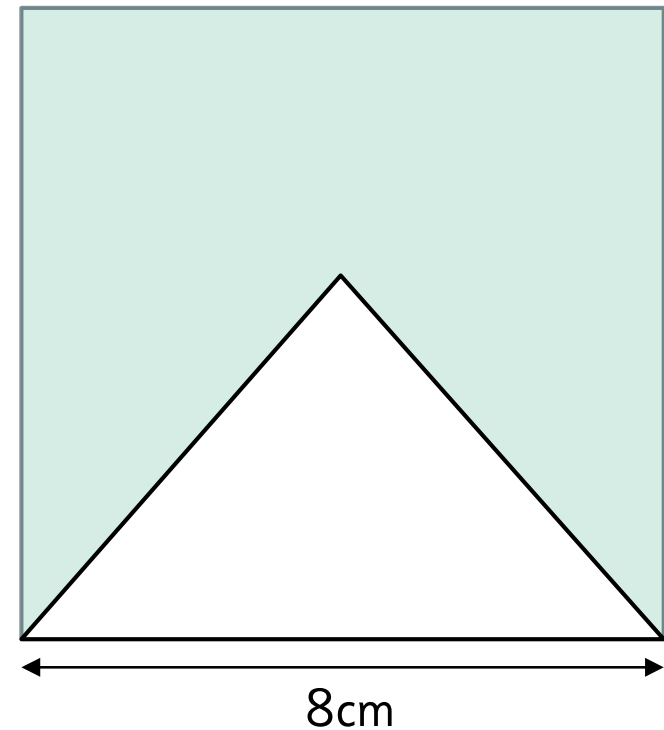




25

Here is a triangle inside a square.  
The triangle is **half** the height of the square.

Calculate the **area** of the shaded part of the shape.





25

Here is a triangle inside a square.  
The triangle is **half** the height of the square.

Calculate the **area** of the shaded part of the shape.

Area of square

$$8 \times 8 = 64 \text{ cm}^2$$

Triangle

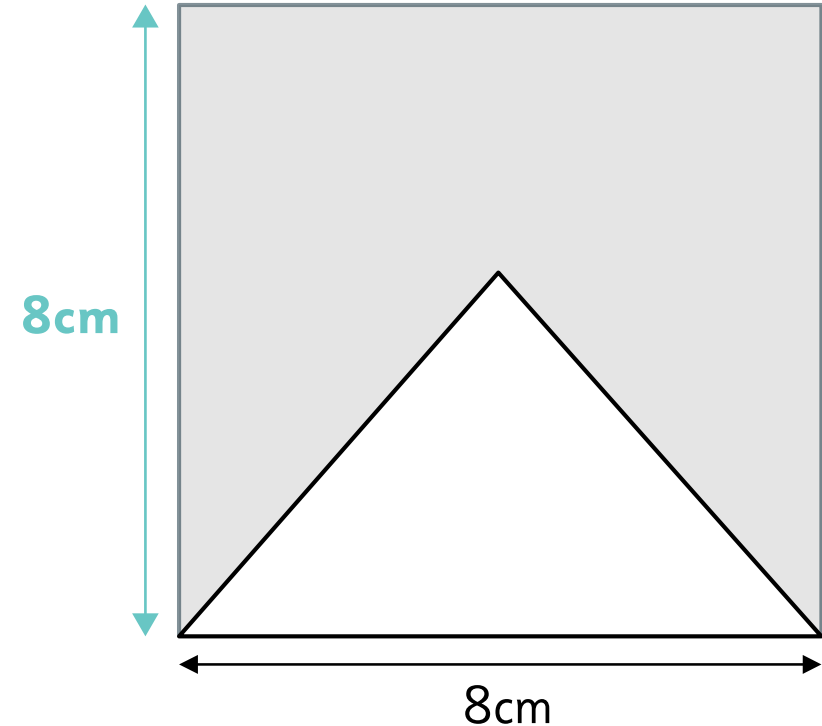
$$\text{Height of triangle} = 8 \div 2 = 4$$

$$4 \times 8 = 32$$

$$32 \div 2 = 16 \text{ cm}^2$$

Shaded area

$$64 - 16 = 48 \text{ cm}^2$$



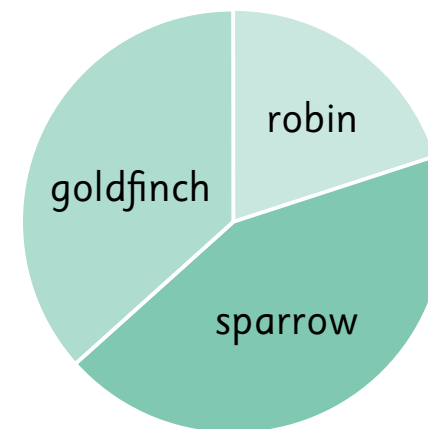
48 cm<sup>2</sup>





26

Inaya makes a pie chart showing the birds in her garden.



Complete the table to work out the size of each angle on the pie chart.

	Number of birds	Size of angle on pie chart
Goldfinch	10	°
Robin	11	°
Sparrows	9	°

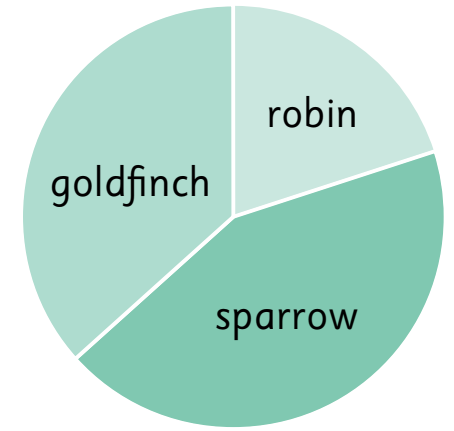




26

Inaya makes a pie chart showing the birds in her garden.

Complete the table to work out the size of each angle on the pie chart.



	Number of birds	Size of angle on pie chart
Goldfinch	10	$120^\circ$
Robin	11	$132^\circ$
Sparrows	9	$108^\circ$

$$10 \times 12 = 120$$

$$11 \times 12 = 132$$

$$9 \times 12 = 108$$

$\text{Total} = 30 \quad \xrightarrow{\quad \quad \quad} 360$   
 $\quad \quad \quad \times 12$

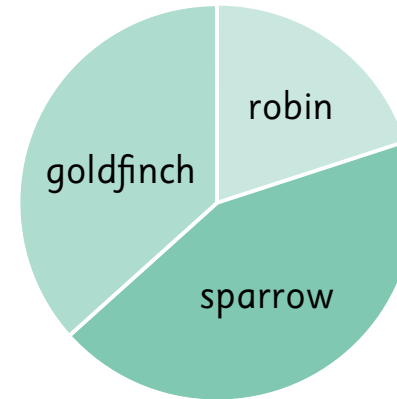




26

Inaya makes a pie chart showing the birds in her garden.

	Number of birds	Size of angle on pie chart
Goldfinch	10	◦
Robin	11	◦
Sparrows	9	◦



Inaya sees 6 more sparrows in her garden.

Calculate the size of the segment for **sparrows** on the new pie chart.

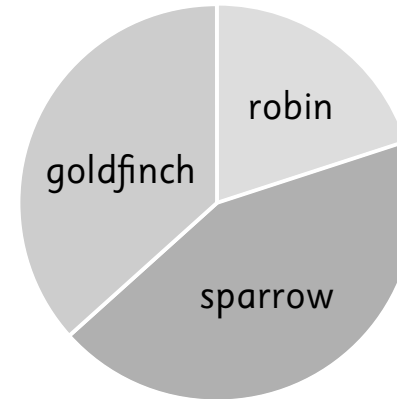




26

Inaya makes a pie chart showing the birds in her garden.

	Number of birds	Size of angle on pie chart
Goldfinch	10	◦
Robin	11	◦
Sparrows	9	◦



Inaya sees 6 more sparrows in her garden.

Calculate the size of the segment for **sparrows** on the new pie chart.

$$9 + 6 = 15$$

$$10 + 11 + 15 = 36$$

The total number of birds is now 36

$$36 \times 10 = 360$$

$$15 \times 10 = 150$$

150°

