# Mathematics test

# Paper 1
## Calculator **not** allowed

Please read this page, but do not open your booklet until your teacher tells you to start.  Write your name and the name of your school in the spaces below.

**First name**  _____

**Last name**  _____

**School**  _____

**Remember**

- The test is 1 hour long.

- You **must not** use a calculator for any question in this test.

- You will need: pen, pencil, rubber, ruler, tracing paper and mirror (optional).

- This test starts with easier questions.

- Try to answer all the questions.

- Write all your answers and working on the test paper – do not use any rough paper.  Marks may be awarded for working.

- Check your work carefully.

- Ask your teacher if you are not sure what to do.

For marker's use only

| Total marks |  |
|---|---|

# Instructions

### Answers

This means write down your answer or show your working and write down your answer.

### Calculators

You **must not** use a calculator to answer any question in this test.

**1.** The shapes below are drawn on square grids.

Each shape has **one line of symmetry**.

Draw the line of symmetry on each shape.
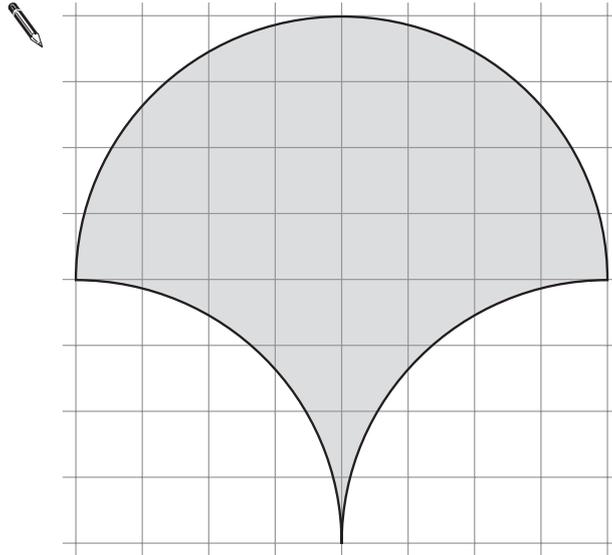
*1 mark*
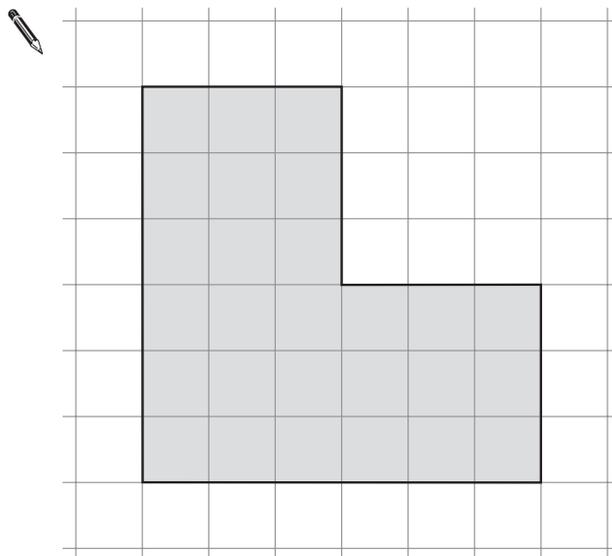
*1 mark*

**2.** This number line shows one way to use **two steps**
to move from 0 to 20

add 8         add 12

0                              20
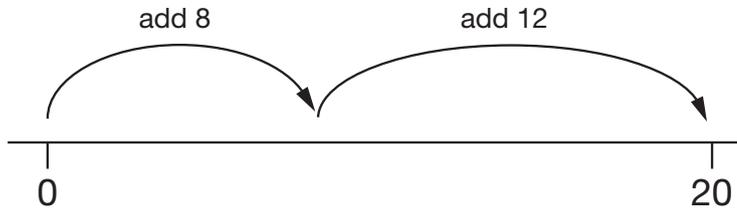
(a) On the number line below, show a **different** way to use **two steps**
to move from 0 to 20

0                              20

1 mark

(b) This number line shows how to use **four steps** of the **same size**
to move from 0 to 20

0                              20
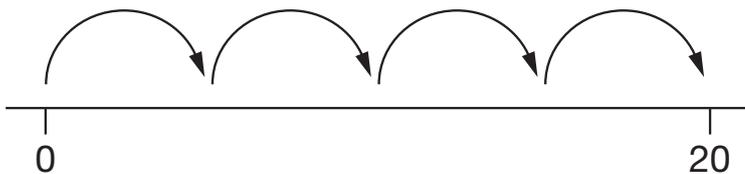
Complete the sentence below.

Each step is **add** _____

1 mark

(c) Write the missing number on each number line to show how to move from 0 to 20

add 9          add 5          add _____

0                                            20

add $17\frac{1}{2}$          add _____

0                                            20

1 mark

subtract _____

add 28

0                                            20
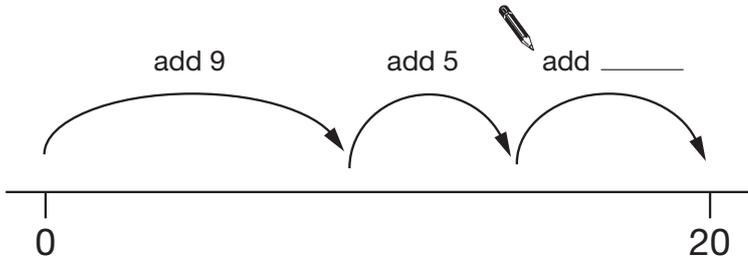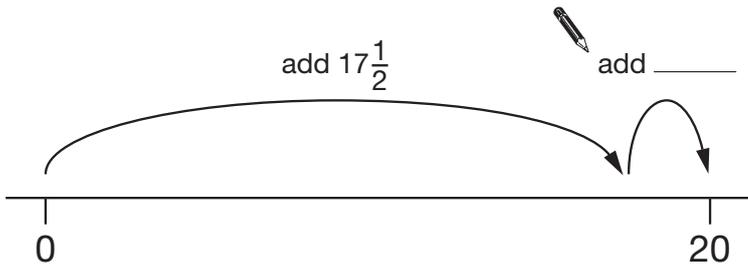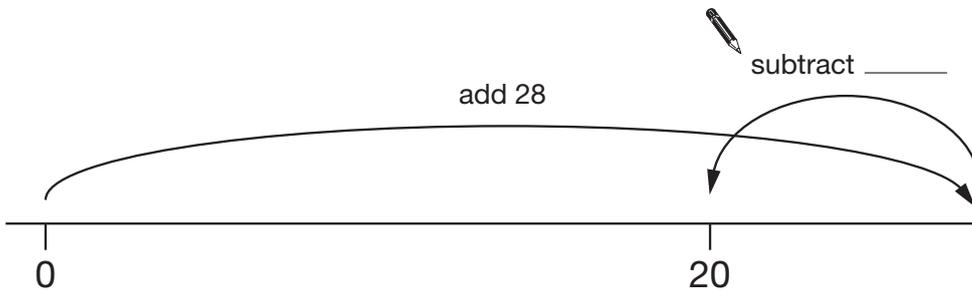
1 mark

**3.** The table shows some temperatures for one day in winter.

| Place | Temperature |
|---|---|
| Inside my **house** | 20°C |
| Inside my **greenhouse** | 8°C |
| **Outside** | −2°C |

Draw arrows on the diagrams below to show these temperatures.

The first one is done for you.

Inside my **house**    Inside my **greenhouse**    **Outside**
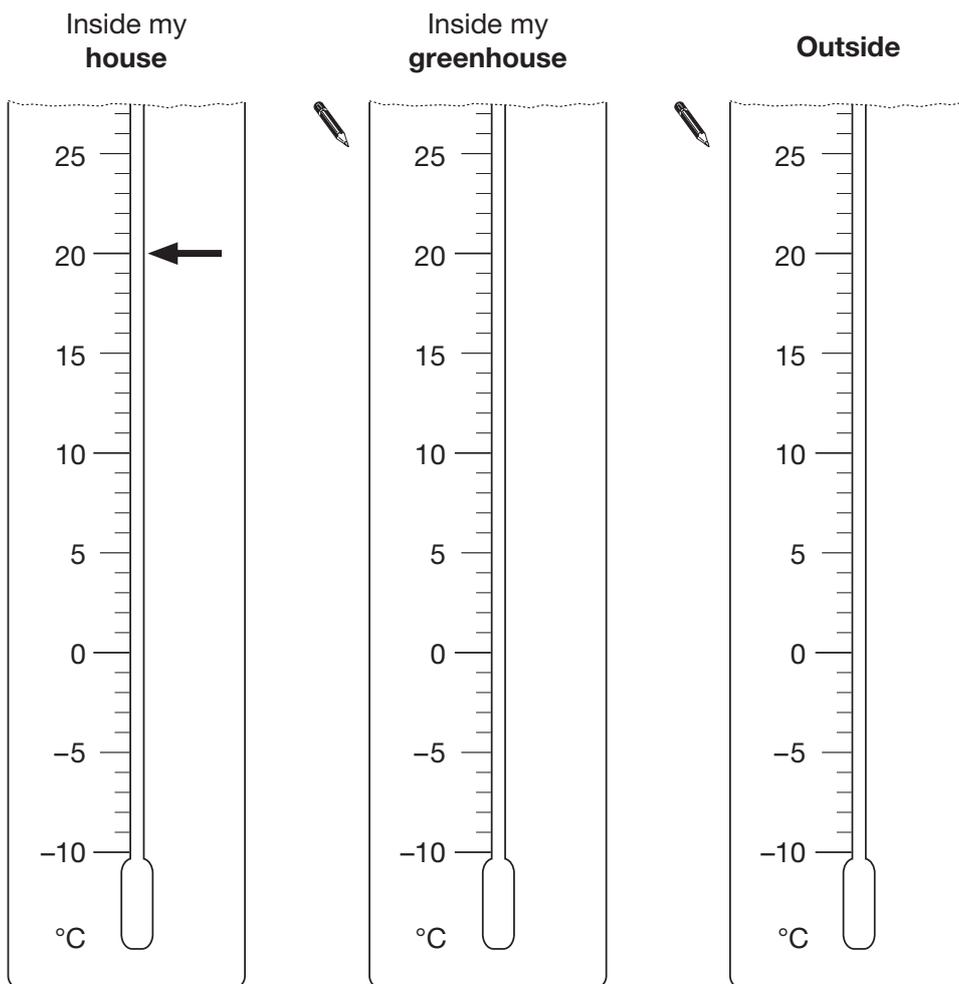
1 mark

1 mark

**4.** There are **28 pupils** in class 9K.

The chart shows the number of pupils **present** each day, in class 9K.
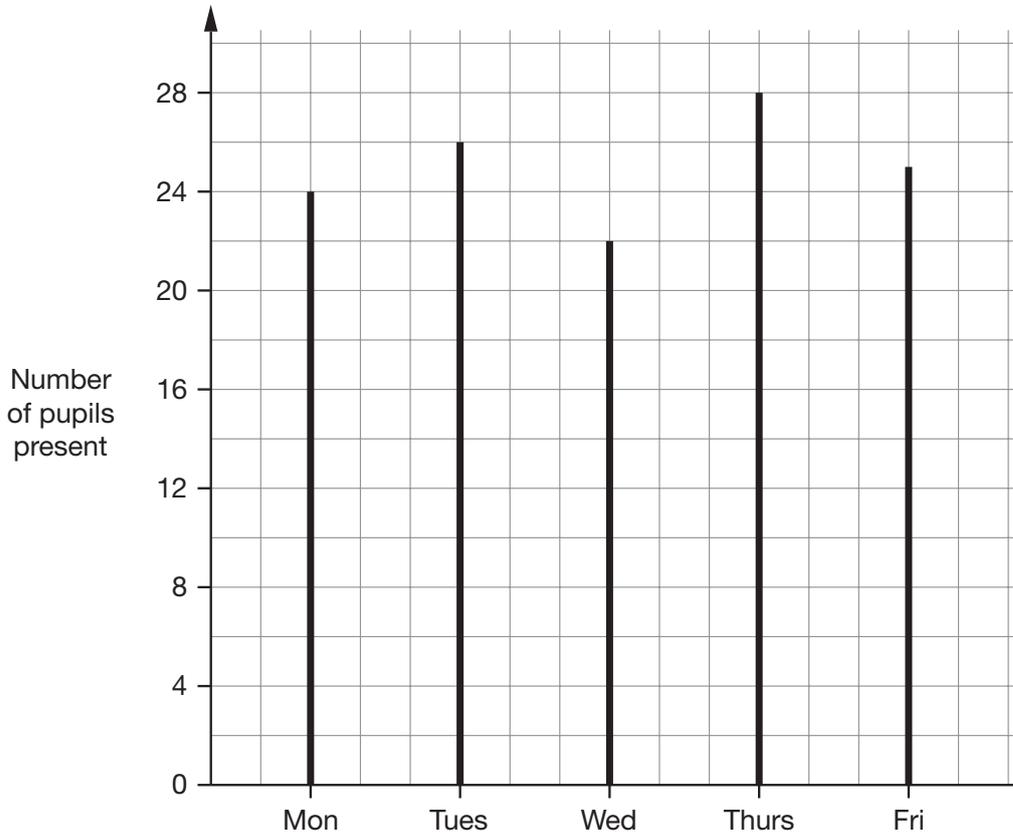


Four pupils were absent on Monday.

Complete the chart below to show the number of pupils **absent** each day, in class 9K.
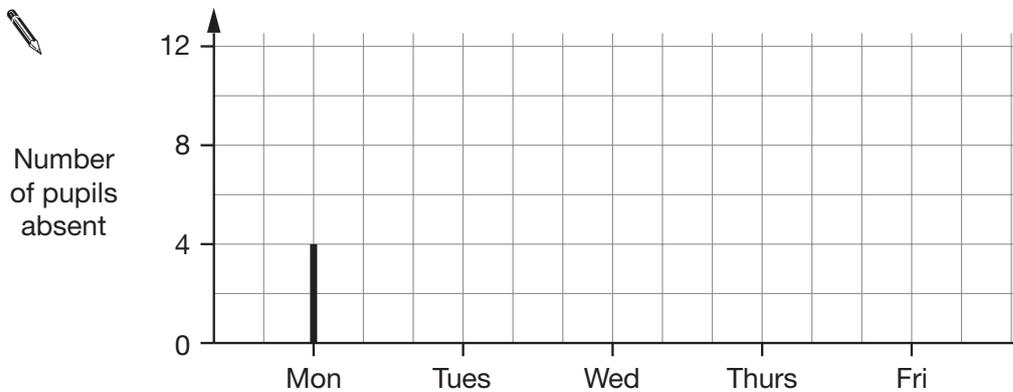


2 marks

**5.**     A shop sells three different sized bottles of lemonade.

1 litre

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

2 litres

39p                     55p                     70p
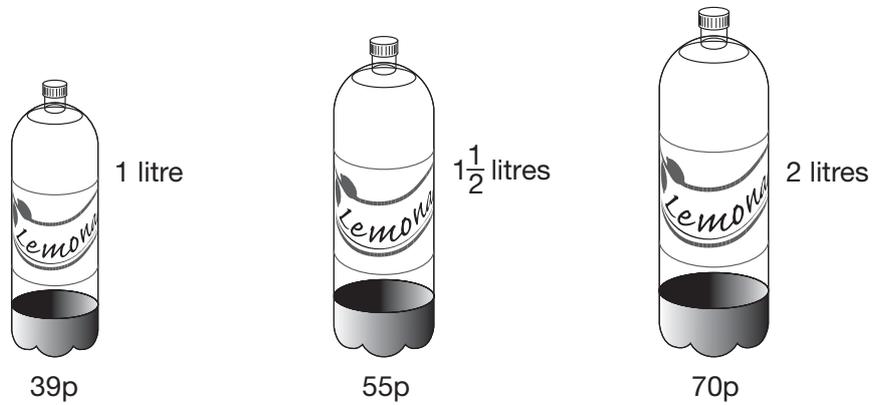
(a)     I want **3 litres** of lemonade.

I could buy **three** bottles of size **1 litre**.

How much would that cost?

£

(b)     Write a **different way** I could buy exactly 3 litres of lemonade.

Now work out how much it would cost.

£

(c)   Write another **different way** I could buy exactly 3 litres of lemonade.

✏️ _____

Now work out how much it would cost.

✏️ £ [_____]

(d)   My friend buys seven bottles of lemonade.

**Two** of the bottles are of size $1\frac{1}{2}$ **litres**.

**Five** of the bottles are of size **2 litres**.

How many litres is that altogether?

✏️

_____ litres

**6.** (a) Work out

$$37 \ + \ 46 \ = \ \underline{\hspace{2cm}}$$

$$37 \ \times \ 5 \ = \ \underline{\hspace{2cm}}$$

(b) What number do you need to **add to 63** to make 100?

$$\underline{\hspace{2cm}}$$

(c) What number do you need to **subtract from 100** to make 38?

$$\underline{\hspace{2cm}}$$

**7.**     On each spinner **write five numbers** to make the statements correct.

It is **certain** that you will get a number **less than 6**
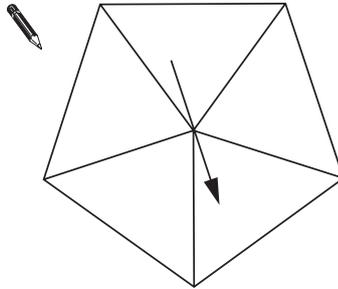
It is **more likely** that you will get an **even** number than an **odd** number.
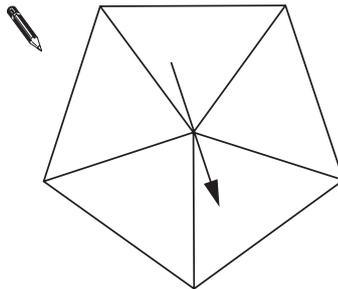
It is **impossible** that you will get a **multiple of 3**
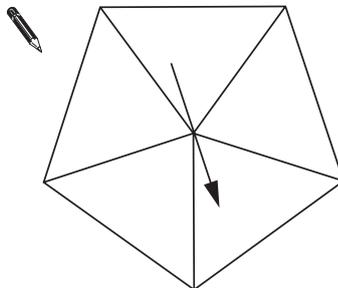
**8.** **Add three** to the number on each number line.

The first one is done for you.

+3

47    50

+3

$1\frac{3}{4}$

1 mark

+3

−5
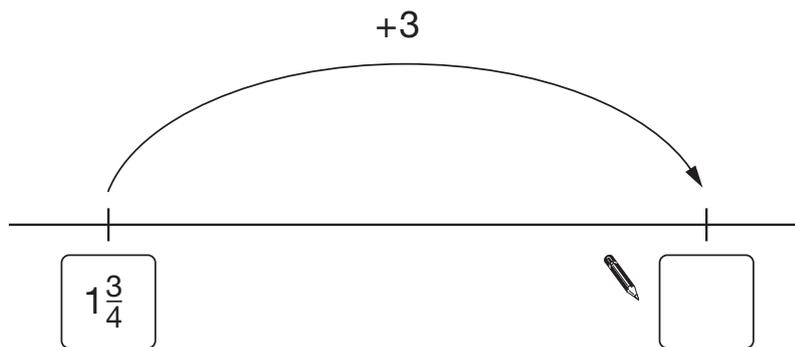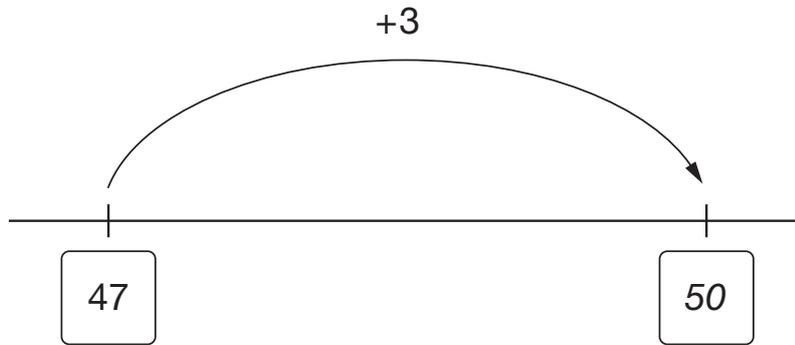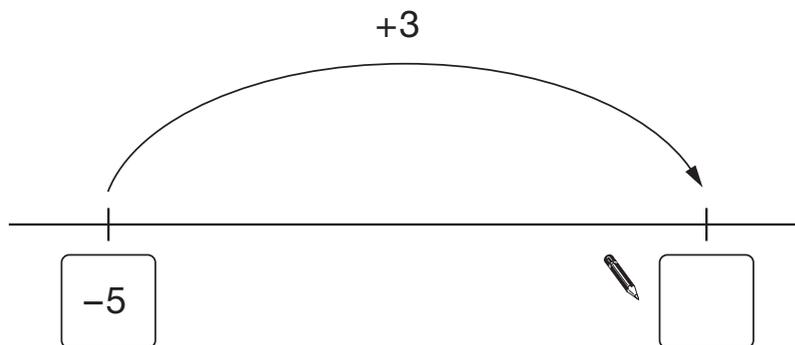
1 mark

**9.**    Work out the missing numbers.

In each part, you can use the first line to help you.

(a)

$$16 \quad \times \quad 15 \quad = \quad 240$$

$$16 \quad \times \quad \rule{2cm}{0.4pt} \quad = \quad 480$$

1 mark

(b)

$$46 \quad \times \quad 44 \quad = \quad 2024$$

$$46 \quad \times \quad 22 \quad = \quad \rule{2cm}{0.4pt}$$

1 mark

(c)

$$600 \quad \div \quad 24 \quad = \quad 25$$

$$600 \quad \div \quad \rule{2cm}{0.4pt} \quad = \quad 50$$

1 mark

**10.**    Red Kites are large birds that were very rare in England.

Scientists set free some Red Kites in 1989 and hoped they would build nests.

The diagrams show how many nests the birds built from 1991 to 1996.

> **Key:**
>
> ×    shows where the birds were set free.
>
> ▫    represents a nest without eggs.
>
> •    represents a nest with eggs.
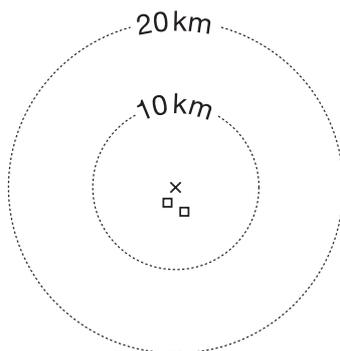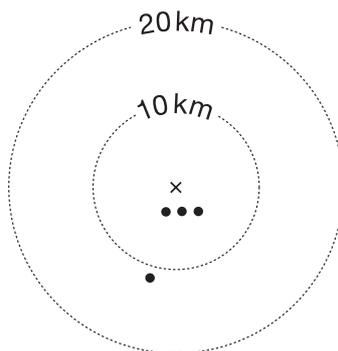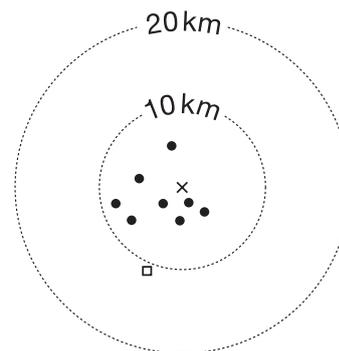


**1991**                **1992**                **1993**
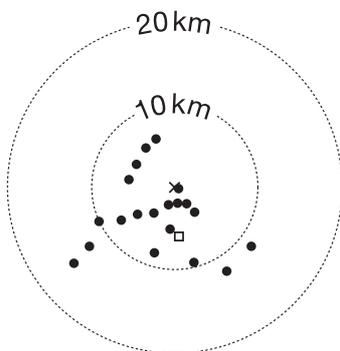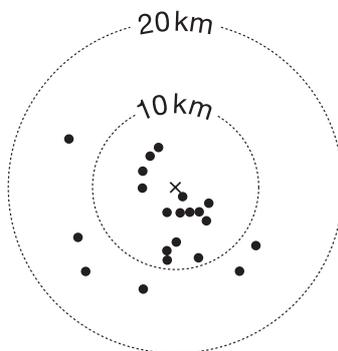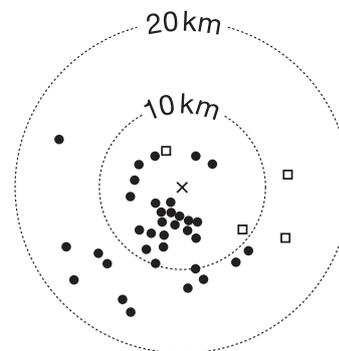


**1994**                **1995**                **1996**

Use the diagrams to answer these questions.

(a) Which was the first year there were nests **with eggs**?

_____

(b) In **1993**, how many nests were there **without eggs**?

_____

(c) In **1995**, how many nests were **more than 10 km** from where the birds were set free?

_____

(d) Explain what happened to the **number** of nests, over the years.

Now explain what happened to the **distances** of the nests from where the birds were set free, over the years.

---

**11.** (a) **Add** together 1740 and 282

✏️ [answer box]

(b) Now **add** together 17.4 and 2.82

You can use part (a) to help you.

✏️ [answer box]

1 mark

(c) 3.5 + 2.35 is **bigger** than 3.3 + 2.1

How much bigger?

✏️

[answer box]

2 marks

**12.** (a)    The line on the square grid below is one side of a **square**.

Draw 3 more lines to complete the square.
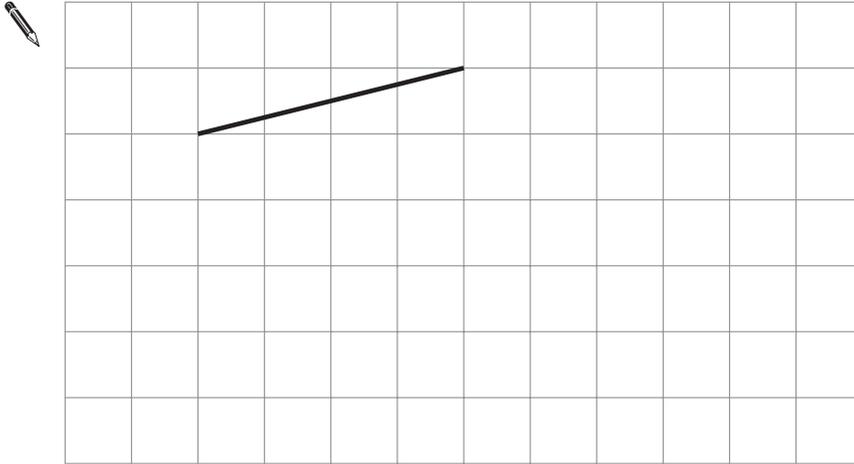
(b)    The line on the square grid below is one side of a **quadrilateral**.

The quadrilateral has **only one pair of parallel sides**.

Draw 3 more lines to show what the quadrilateral could be.
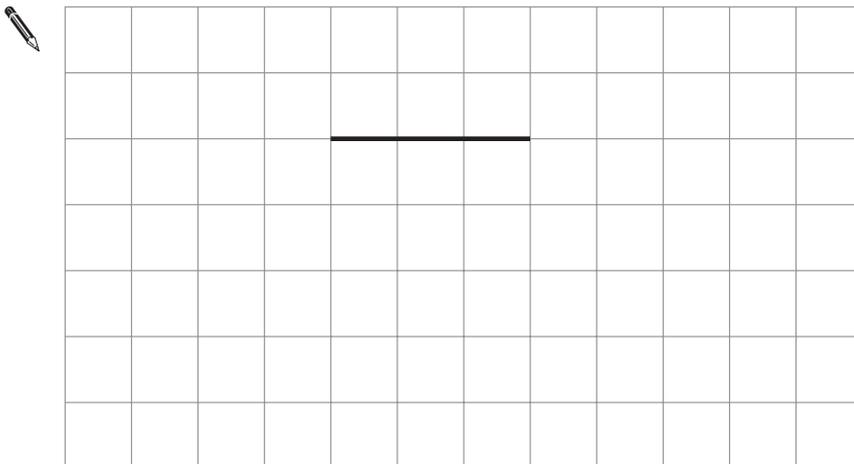
**13.** (a)  Show that **9 × 28** is **252**

(b)  What is **27 × 28**?

You can use part (a) to help you.



2 marks

**14.**   A ruler costs $k$ pence.

A pen costs $m$ pence.

Match each statement with the correct expression for the amount in pence.

The first one is done for you.

| Statement | Expression |
|---|---|

$5k$

The total cost
of 5 rulers

$5m$

$5 - 5m$

The total cost
of 5 rulers and 5 pens

$500 - 5m$

$5k + m$

How much more 5 pens cost
than 5 rulers

$5(k + m)$

$5m - 5k$

1 mark

The change from £5,
in pence, when you buy 5 pens

1 mark

$5k - 5m$

1 mark

**15.** (a)   I have a square piece of paper.

The diagram shows information about this square labelled A.

A

8 cm

8 cm
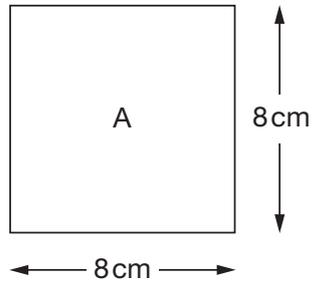
I fold square A **in half** to make rectangle B.

B
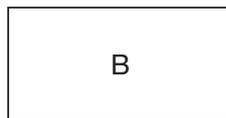
Then I fold rectangle B **in half** to make square C.

C
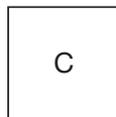
Complete the table below to show the area and perimeter of each shape.

|  | Area | Perimeter |
|---|---|---|
| Square A | cm$^2$ | cm |
| Rectangle B | cm$^2$ | cm |
| Square C | cm$^2$ | cm |

3 marks

(b)  I start again with square A.

A

8 cm

8 cm
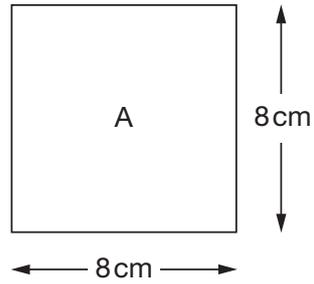
Then I fold it **in half** to make triangle D.

D
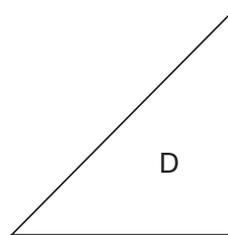
What is the **area** of triangle D?

_____ cm$^2$

(c)  One of the statements below is true for the **perimeter** of triangle D.

Tick (✓) the correct one.

The perimeter is less than 24 cm.

The perimeter is 24 cm.

The perimeter is greater than 24 cm.

Explain your answer.

**16.** (a)   Work out the missing values.

10% of 84 = _____

5% of 84 = _____

$2\frac{1}{2}$% of 84 = _____

(b)   The cost of a CD player is £84 **plus** $17\frac{1}{2}$ % tax.

What is the **total** cost of the CD player?

You can use part (a) to help you.

£ [        ]

2 marks

**17.**     Solve these equations.

$2k + 3 = 11$

$k =$ _____

$2t + 3 = -11$

$t =$ _____

**18.** (a)   I am thinking of a number.

My number is a **multiple of 4**

Tick (✓) the true statement below.

| My number must be even | My number must be odd | My number could be odd or even |
|:---:|:---:|:---:|
| ☐ | ☐ | ☐ |

Explain how you know.

1 mark

(b)   I am thinking of a **different** number.

My number is a **factor of 20**

Tick (✓) the true statement below.

| My number must be even | My number must be odd | My number could be odd or even |
|:---:|:---:|:---:|
| ☐ | ☐ | ☐ |

Explain how you know.

1 mark

**19.** Look at this sequence of patterns made with hexagons.
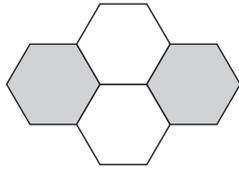
pattern number **1**
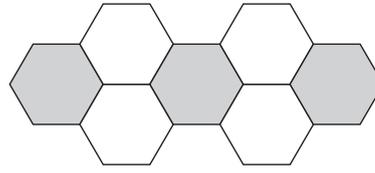
pattern number **2**
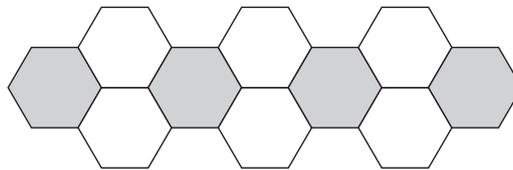
pattern number **3**

To find the number of hexagons in pattern number $n$ you can use these rules:

> Number of **grey** hexagons $= n + 1$
>
> Number of **white** hexagons $= 2n$

**Altogether**, what is the total number of hexagons in **pattern number 20**?

2 marks

**END OF TEST**

**END OF TEST**

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