Ma

KEY STAGE
3

TIER
4–6

Year 9 mathematics test

Paper 1
Calculator **not** allowed

First name

Last name

Class

Date

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

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 and a ruler.
- Some formulae you might need are on page 2.
- 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 marking use only

Total marks	

Instructions

Answers

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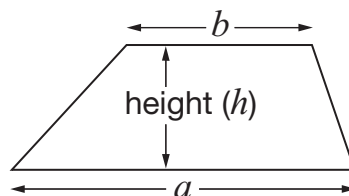
Calculators

You **must not** use a calculator to answer any question in this test.
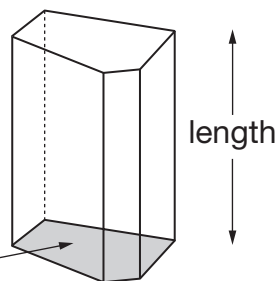
Formulae
You might need to use these formulae

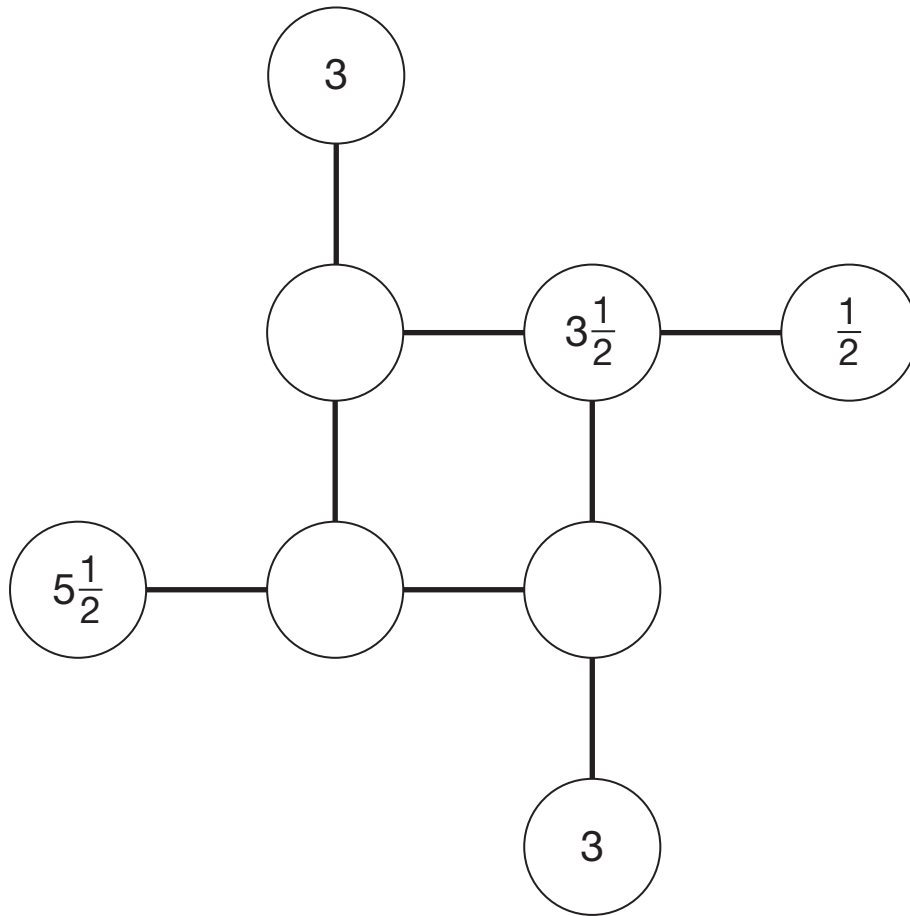**Trapezium**

Area $= \frac{1}{2}(a + b)h$

Prism

area of cross-section

length

Volume = area of cross-section × length

1. Complete this diagram so that the three numbers in each line **add to 8**

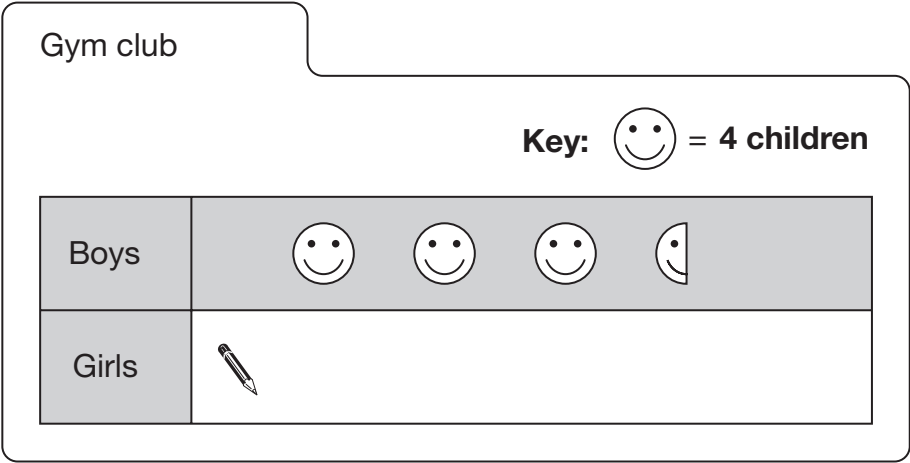**2.** A sports centre has two different clubs.

(a) **22 children** go to the gym club.

Complete the pictogram.

Gym club

Key: ☺ = **4 children**

Boys	☺ ☺ ☺ ◖
Girls	✏

1 mark

(b) **10 more girls** than boys go to the swimming club.

Complete the key.

Swimming club

✏ **Key:** ☺ = _____ **children**

1 mark

Boys	☺ ☺ ☺
Girls	☺ ☺ ☺ ☺ ☺
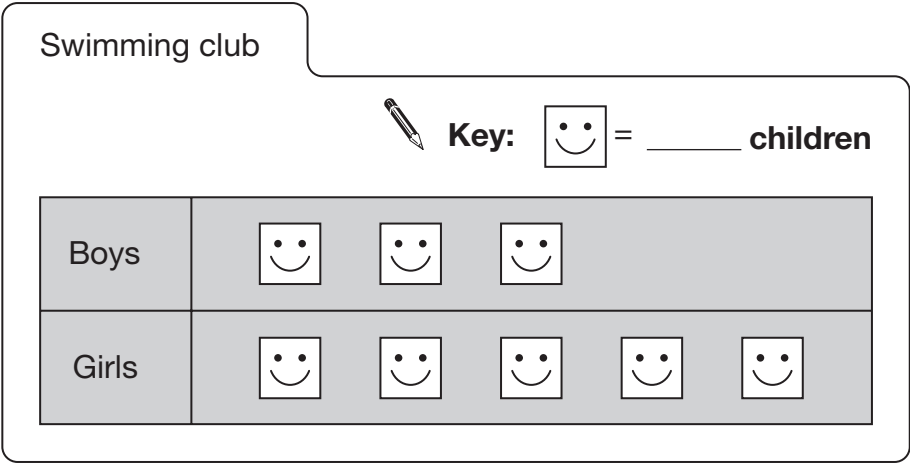
3. In a school, lessons are **55 minutes** long.

(a) A maths lesson **starts** at 9:15am

At what time does the lesson **end**?

_____ : _____ am

(b) A history lesson **ends** at 3:30pm

At what time does the lesson **start**?

_____ : _____ pm

(c) Lunch break is $1\frac{1}{4}$ **hours** long.

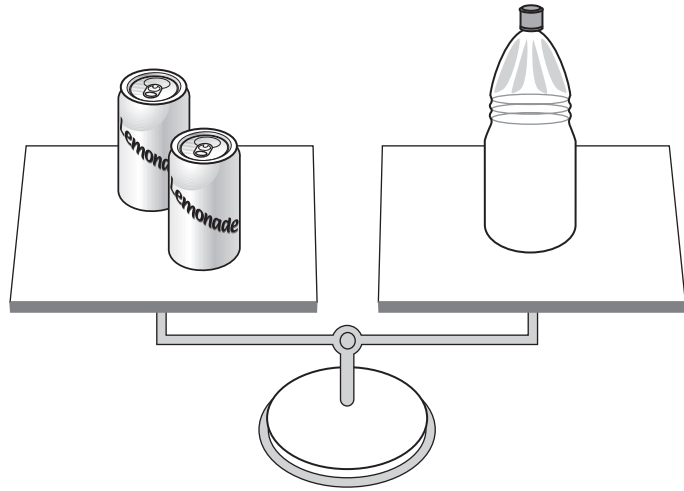Lunch break **ends** at 1:30pm
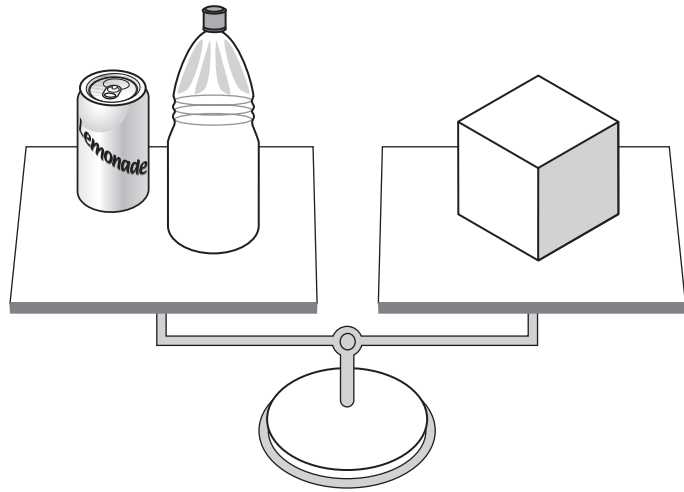
At what time does it **start**?

_____ : _____ pm

4.   2 tins balance 1 bottle.

1 tin and 1 bottle balance 1 box.

(a) How many **bottles** do **6 tins** balance?

1 mark

(b) How many **boxes** do **6 tins** balance?

1 mark

5. (a)   Look at this information about recycling:

> **25** large plastic bottles can be recycled to make **1** fleece jacket.

Write the missing number in this sentence.

200 large plastic bottles can be recycled to make _____ fleece jackets.

1 mark

(b)   In a survey, **9 out of 10** people said they would like to recycle more.

What percentage of people said they would like to recycle more?
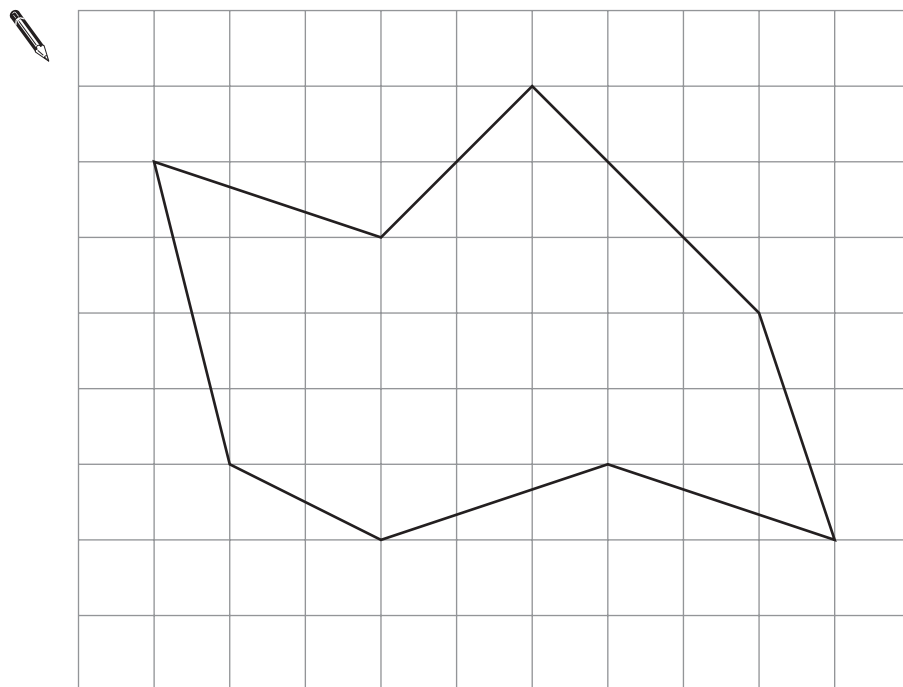
_____ %

1 mark

6.   Look at the shape drawn on a square grid.

(a)   What is the name of the shape?

Put a ring round the correct name below.

hexagon   quadrilateral   octagon

pentagon   parallelogram

(b)   One of the angles inside the shape is a **right angle**.

Mark the right angle on the shape above.

ab

7. A teacher said:

> Choose values for a and b
>
> Use the letters to make expressions for the numbers 1 to 8

(a) One group of pupils chose $a = 2$ and $b = 3$

Complete their table.

$a = 2$ $b = 3$		
$b - a$	$=$	1
a	$=$	2
b	$=$	3
$2 \times a$	$=$	4
	$=$	5
$a \times b$	$=$	6
$2 \times a + b$	$=$	7
	$=$	8

1 mark

1 mark

(b) Here is part of the table from a **different** group of pupils.

$2 \times a$	$=$	6
$a + b$	$=$	7

What values did they choose?

1 mark

$a =$ _____ $b =$ _____

1 mark

8.   The graph shows a **rectangle.**

y

(0, 9)   P

(0, 5)   (12, 5)

Not drawn
accurately

0   x
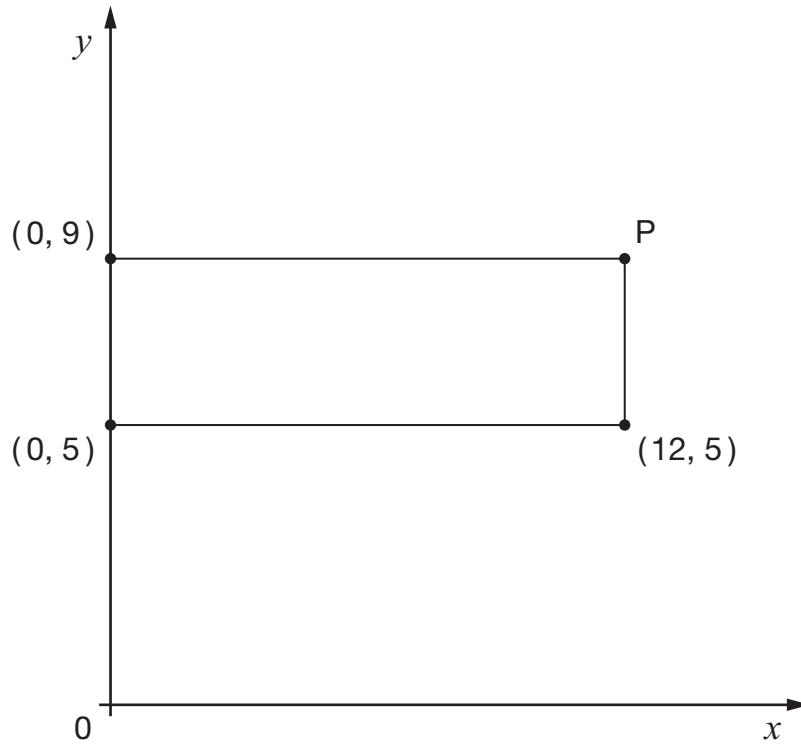
Write the coordinates of point P

✎

(_____ , _____)

2 marks

9.   The table below helps to change centimetres into inches.

Number of centimetres	2	4	6	8	10	12
Number of inches (approximately)	0.8	1.6	2.4	3.1	3.9	4.7

About how many **inches** are there in **14 centimetres**?

_____ inches

1 mark

11. (a)   Work out the answer.

2   +   (16   ÷   2)   +   6   =   _____

(b)   Put brackets in the calculation below to make it correct.

2   +   16   ÷   2   +   6   =   4

12.   Here is part of a train timetable.

Paddington	07 45	13 35
Redruth	12 47	_____

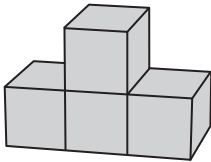(a)   How long is the journey time from Paddington to Redruth on the 07 45 train?

_____ hours and _____ minutes

(b)   The 13 35 train from Paddington takes 4 hours 26 minutes to travel to Redruth.

Write the missing time in the timetable.

072009_p1.46.indd   13   07/12/2009   12:38:55

13.   Alison builds a shape with some cubes.

These are the front view, side view and top view of her shape.

		front view				side view				top view		
		▨				▨						
	▨	▨	▨			▨				▨	▨	▨

Tariq builds a different shape with some cubes.
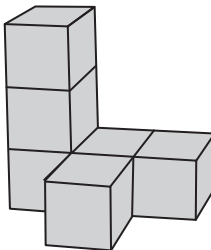
Draw the front view, side view and top view of his shape.

		front view				side view				top view		

2 marks

14. (a) When $y = 1$, which expression below has the **largest value**?

Put a ring round it.

$3 + y$ $\qquad\qquad$ $10 - y$ $\qquad\qquad$ y^2

$\qquad\qquad$ $3y$ $\qquad\qquad$ $\dfrac{y}{2}$

1 mark

(b) When $y = 4$, which expression below has the **largest value**?

Put a ring round it.

$3 + y$ $\qquad\qquad$ $10 - y$ $\qquad\qquad$ y^2

$\qquad\qquad$ $3y$ $\qquad\qquad$ $\dfrac{y}{2}$

1 mark

(c) Write a number to make the sentence below true.

When $y =$ _____ , the expression $3 + y$ has a **larger value** than the expression $3y$

1 mark

072009_p1.46.indd   15 $\qquad\qquad$ 07/12/2009   12:38:56

15. The graph shows the temperature in a town between 6am and 2pm on 7th February and 7th August one year.
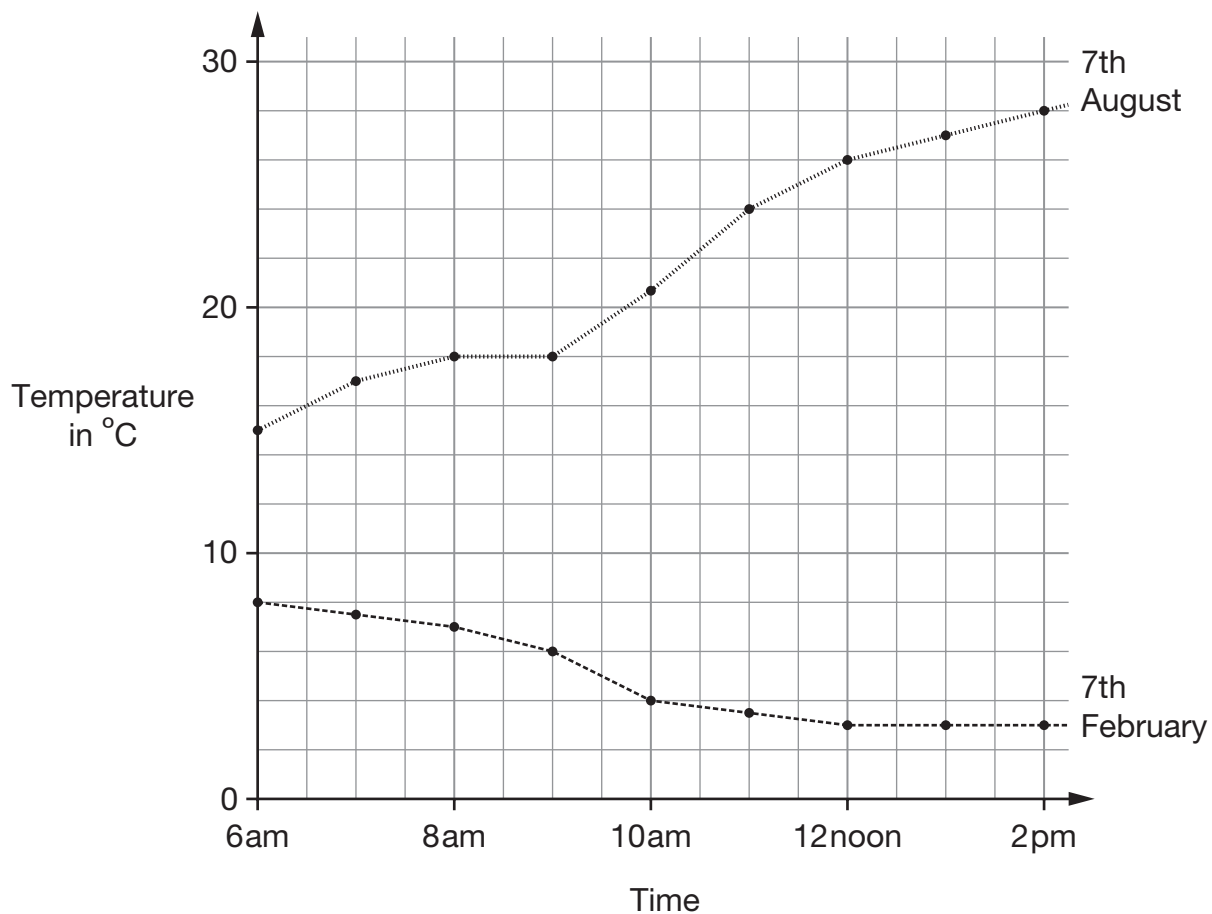
(a) Estimate as accurately as you can the time when the temperature reached 20°C on 7th August.

_____ am

(b) What was the difference between the temperatures at 12 noon on the two days?

_____ °C

(c) On 7th February between 6am and 2pm the temperature dropped.

How many degrees did the temperature drop?

_____ °C

16.   In 2005, about 60.2 million people lived in the UK.

Look at the information about these people.

- ■   50.4 million lived in England.

- ■   5.1 million lived in Scotland.

- ■   3 million lived in Wales.

- ■   The rest lived in Northern Ireland.

(a)   In 2005, about how many people lived in Northern Ireland?

| million |

1 mark

(b)   In 2005, about what percentage of people in the UK lived in Wales?

Tick (✓) the correct value.

☐ 1%   ☐ 5%   ☐ 20%   ☐ 63%

1 mark

17. (a)   What number is halfway between **–2** and **6**?

_____

1 mark

(b)   Complete the sentence.

–10 is halfway between _____ and **8**

1 mark

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18.   Here is a quadrilateral drawn on a square grid.

2 marks

On the same grid, draw a **different quadrilateral** which has the **same area**.

19. Look at the equation.

$$14n = 98$$
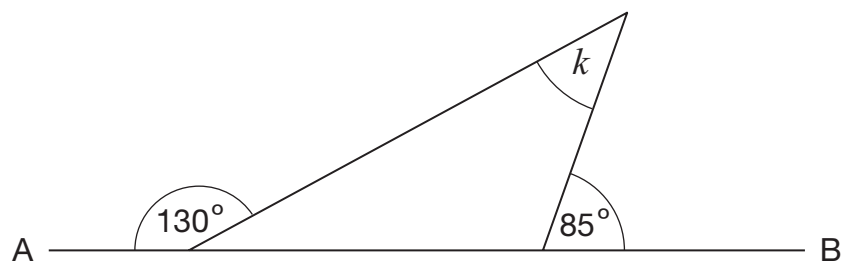
(a) Work out the value of **140*n***

_____

(b) Work out the value of **14(*n* + 1)**

_____

20. Look at the diagram.

Not drawn
accurately

k

130° 85°

A ———————————————————————— B

AB is a straight line.

Work out the size of angle k

$k =$ _____ °

21. Look at the sequence below.

To get the next term in the sequence, **subtract 90** from the term before.

500 410 320 …

Write the first two terms of the sequence that are **less than zero**.

_____ , _____

22. (a) Look at this information.

$$x \leq 0$$

Give an example of what the value of x could be.

_____

Give a **different** example of what the value of x could be.

_____

(b) Now look at this information.

$$2y + 3 \leq 11$$

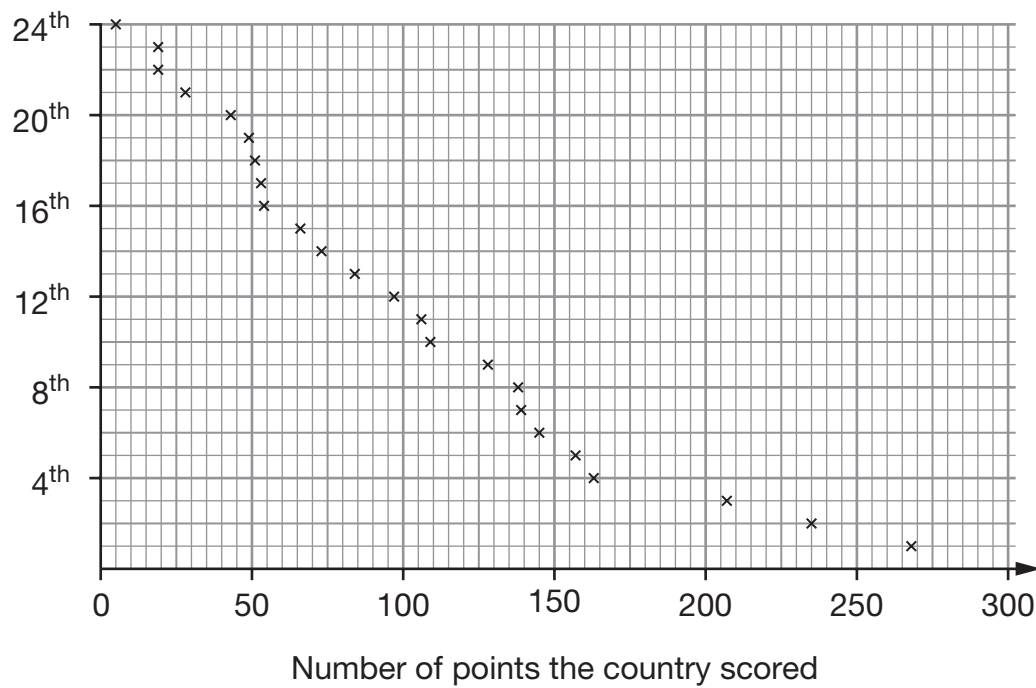What is the **largest** value that y could be?
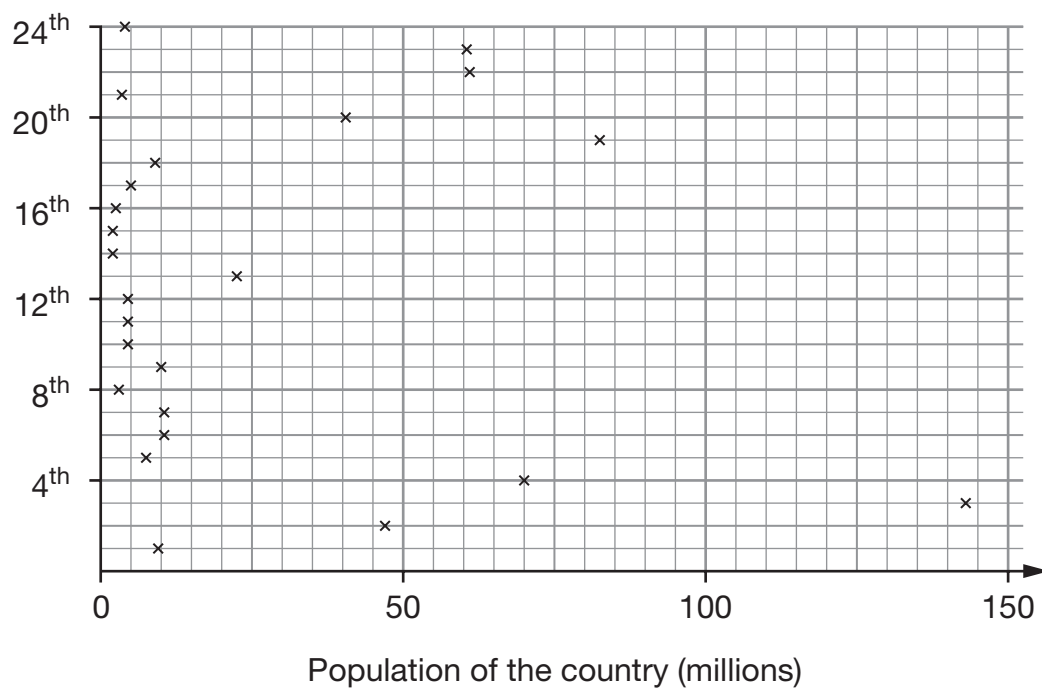
_____

23. Each year a song contest is held in Europe.

The country with the greatest number of points wins.

The scatter graphs show information about the contest in 2007.

Number of points the country scored

Population of the country (millions)

Use the graphs to answer these questions.

(a)   About how many points did the winning country score?

_____

1 mark

(b)   How many countries scored **fewer than 60** points?

_____

1 mark

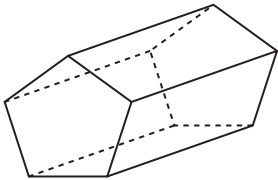(c)   What is the population of the country that scored **84** points?

_____ million

1 mark

24. The table shows information about a **pentagonal** prism.

	Pentagonal prism
Number of **vertices**	10
Number of **rectangular faces**	5
Total number of **faces**	7

Pentagonal prism

(a) Complete the table to show information about a **triangular** prism.

	Triangular prism
Number of **vertices**	✎
Number of **rectangular faces**	✎
Total number of **faces**	✎

1 mark

(b) Complete the table.

	✎ _____ prism	✎ _____ prism
Number of **vertices**	12	✎
Number of **rectangular faces**	6	✎
Total number of **faces**	8	10

3 marks

25. Write numbers in the boxes so that the fractions are in size order.

$$\frac{1}{4} \qquad \frac{\boxed{}}{7} \qquad \frac{1}{\boxed{}} \qquad \frac{3}{5} \qquad \frac{2}{\boxed{}}$$

26. (a) I **add** the expressions **n** and **$n + 2$**

Put a ring round the expression that shows the result.

$$2n \qquad\qquad 4n \qquad\qquad n(n + 2)$$

$$n^2 + 2 \qquad\qquad 2n + 2$$

(b) Now I **multiply** the expressions **n** and **$n + 2$**

Put a ring round the expression that shows the result.

$$2n \qquad\qquad 4n \qquad\qquad n(n + 2)$$

$$n^2 + 2 \qquad\qquad 2n + 2$$

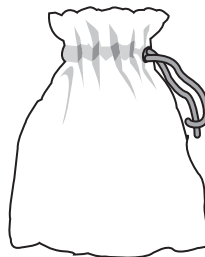**27.**   Jerry has a bag of counters.

Inside his bag are

2 blue,

4 green,

5 red, and

9 yellow counters

Jerry is going to take a counter at random from his bag.

Write the correct **colours** to complete these sentences.

The probability that it will be ⸺⸺⸺⸺ is **0.2**

The probability that it will **not** be ⸺⸺⸺⸺ is $\frac{3}{4}$

1 mark

END OF TEST