Entrance exam 2019-20

MARK SCHEME

You may not use a calculator to answer any questions in this test.

Section A: Write the answer to each question in the answer box. You may use the grid for your working out. There are a total of 20 marks available in this section.

1.

952 + 139 =

1091

1 mark

2.

237 x 3 =

711

1 mark

3.

452 - 191 =

261

1 mark

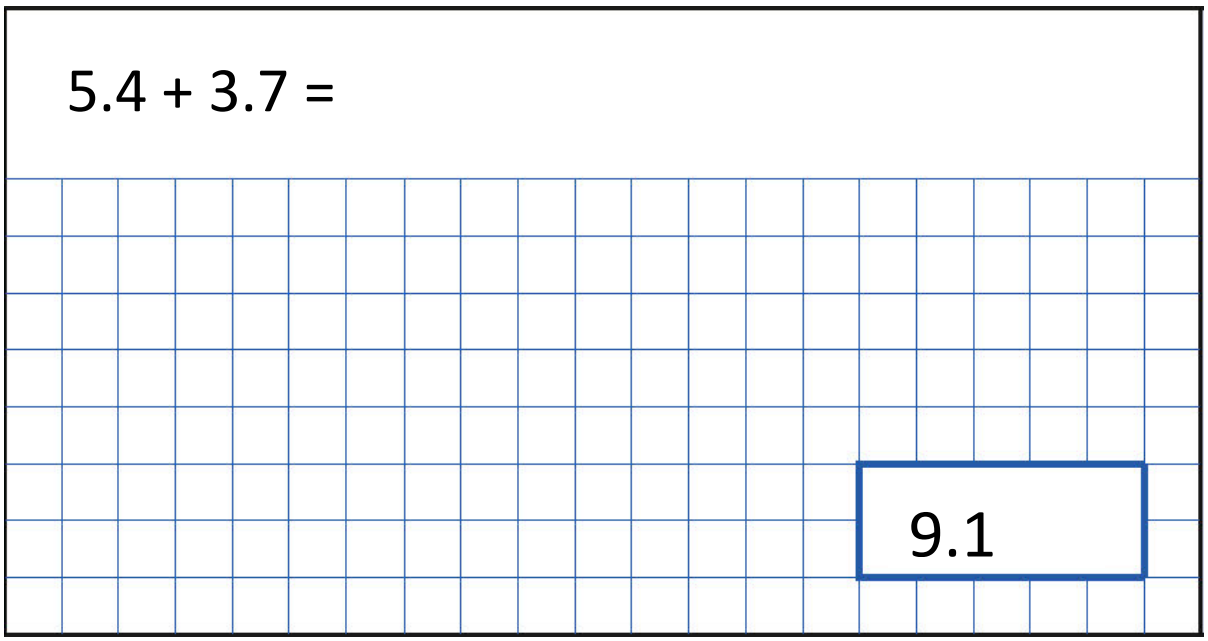
4.

427 ÷ 7 =

61

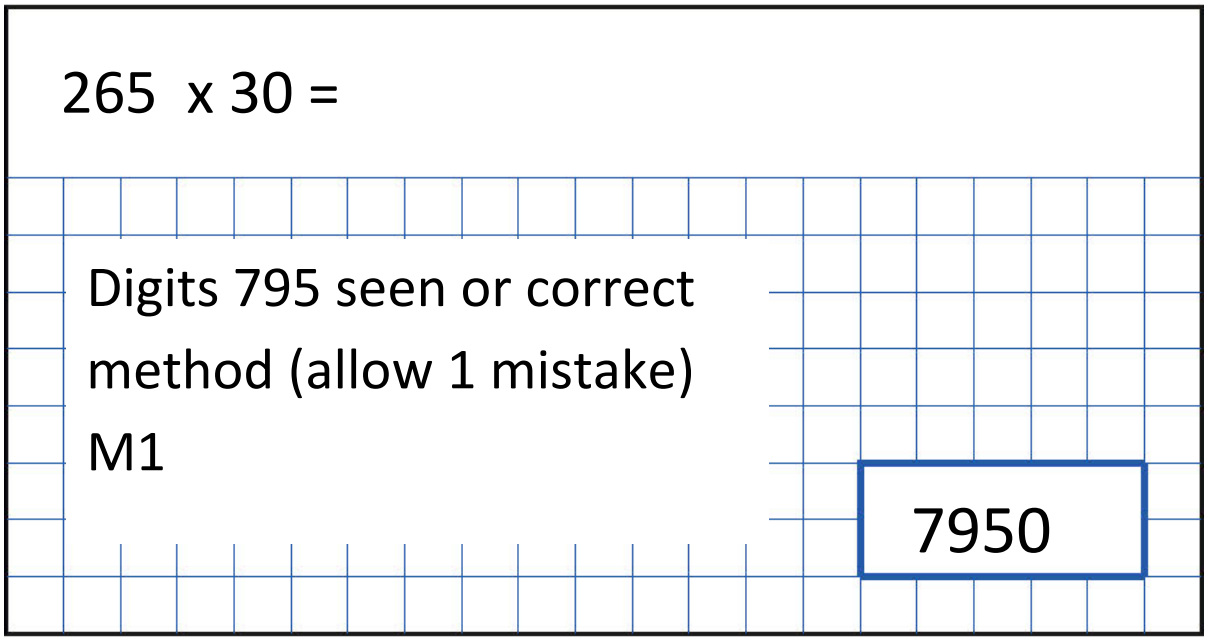
1 mark

5.



1 mark

6.



2 marks

7.

5 x 7 x 8 =

Correct multiplication of any 2 numbers i.e. 35 x 8 seen M1

280

2 marks

8.

6.5 + 2.55 =

9.05

2 marks

9.

$\frac{4}{7} - \frac{1}{7} =$

$\frac{3}{7}$

1 mark

10.

$729 \div 9 =$

81

1 mark

11.

$17.42 \times 1000 =$

17420

1 mark

12.

$8^2 + 27 =$

64 seen B1

91

2 marks

13.

25% of 1200 =

Clear attempt to divide by 4

or other correct method M1

300

2 marks

14.

$\frac{3}{4} \times \frac{1}{7} =$

A1 for numerator

A1 for denominator

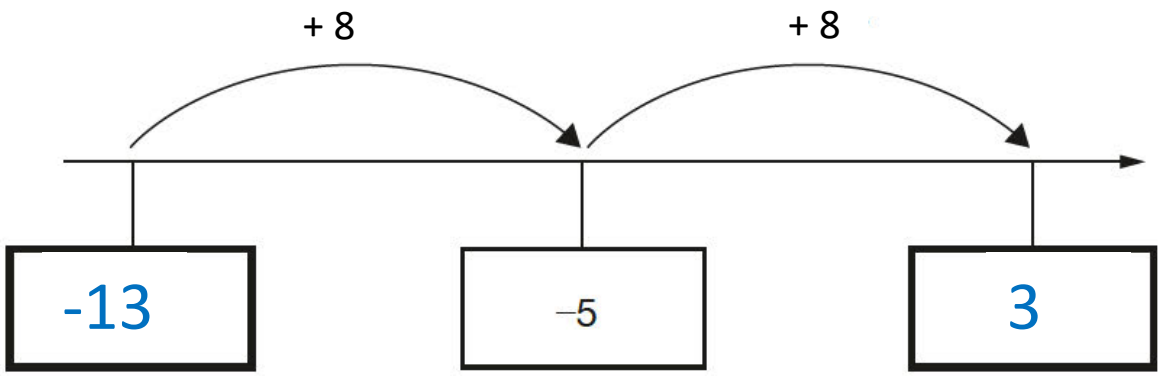
$\frac{3}{28}$

2 marks

Section B: For these questions, show your working in the space provided.

1. Here is part of a number line.

Write the missing numbers in the boxes



2 marks

2. Write the missing number.

One is done for you.

190 → is 30 more than → 160

267 → is 30 more than → 237

1 mark

3.

(a) The term-to-term rule of the sequence is | Multiply by 2 |

The third term of this sequence is 6.

…….. …….. 6 ……..

Work out the first term of this sequence.

Attempt to divide by 2 (M1)

1.5 (A1)

2 marks

(b) Here are the first two terms of a sequence.1

2 8 …….. ……..

The term-to-term rule of the sequence is | Multiply by 3 and add 2 |

Work out the next two terms of the sequence.

26 (A1)

80 (A1 – allow FT from incorrect 26)

Answer..... and .....

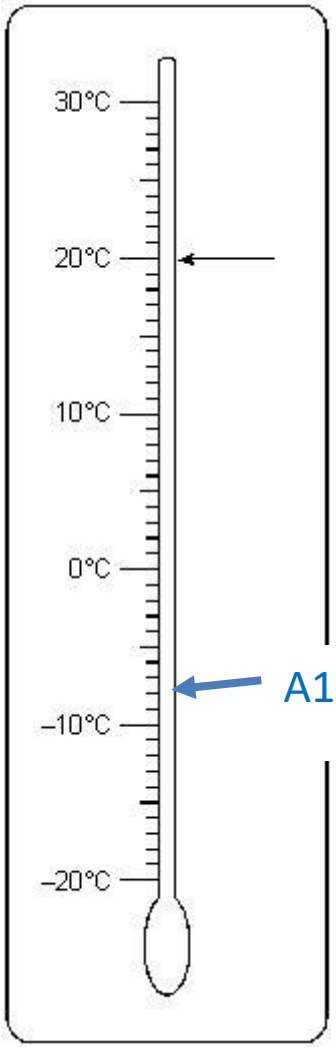
2 marks

4.

Temperature

The arrow by this thermometer shows a temperature of **20°C**

(a) Draw an arrow by the thermometer to show a temperature of **–8°C**



1 mark

(b) The temperature was **–10°C**
It **went up** by **15°C**
What is the new temperature?

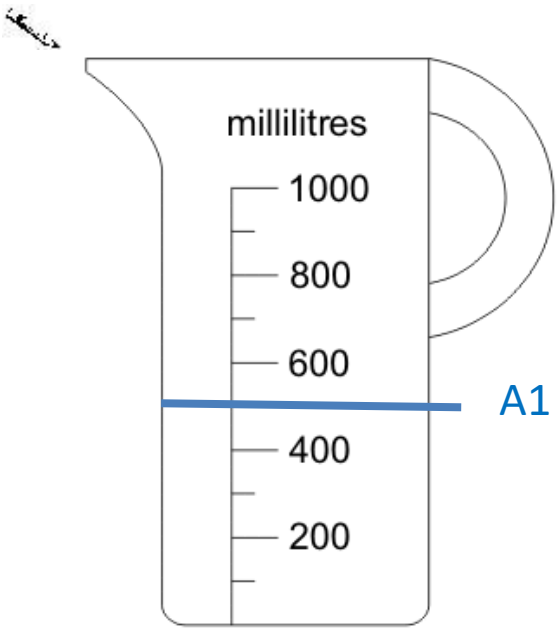
5 °C (A1)

1 mark

5. Sarah has 0.5 **litres** of water in a jug.

She pours this water into the jug below.

Draw the correct level of the water on the jug.



1 mark

6. **Round 132 621**

to the nearest 10,000	130 000
to the nearest 1,000	133 000
to the nearest 100	132 600

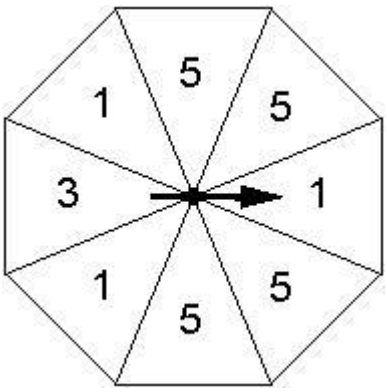
3 marks

7.

Spinner

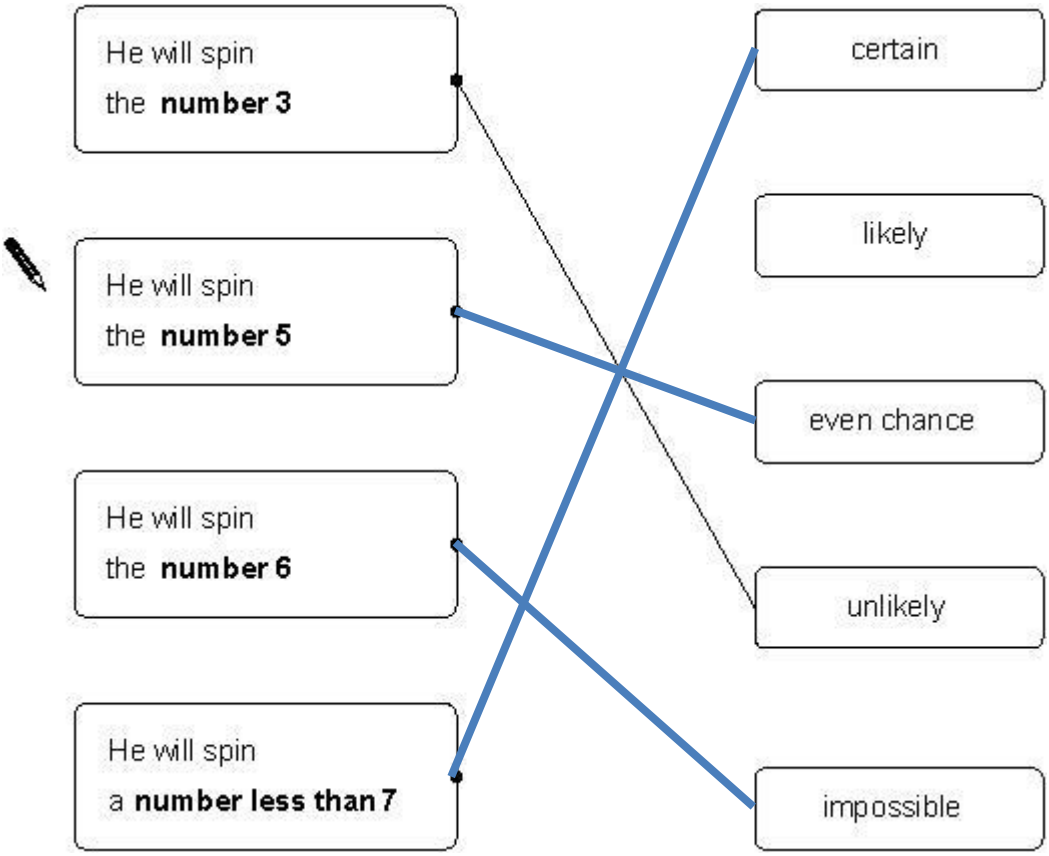
Tom has a fair spinner with 8 equal sections.

He is going to spin the pointer.



Draw lines to show how likely the following are.

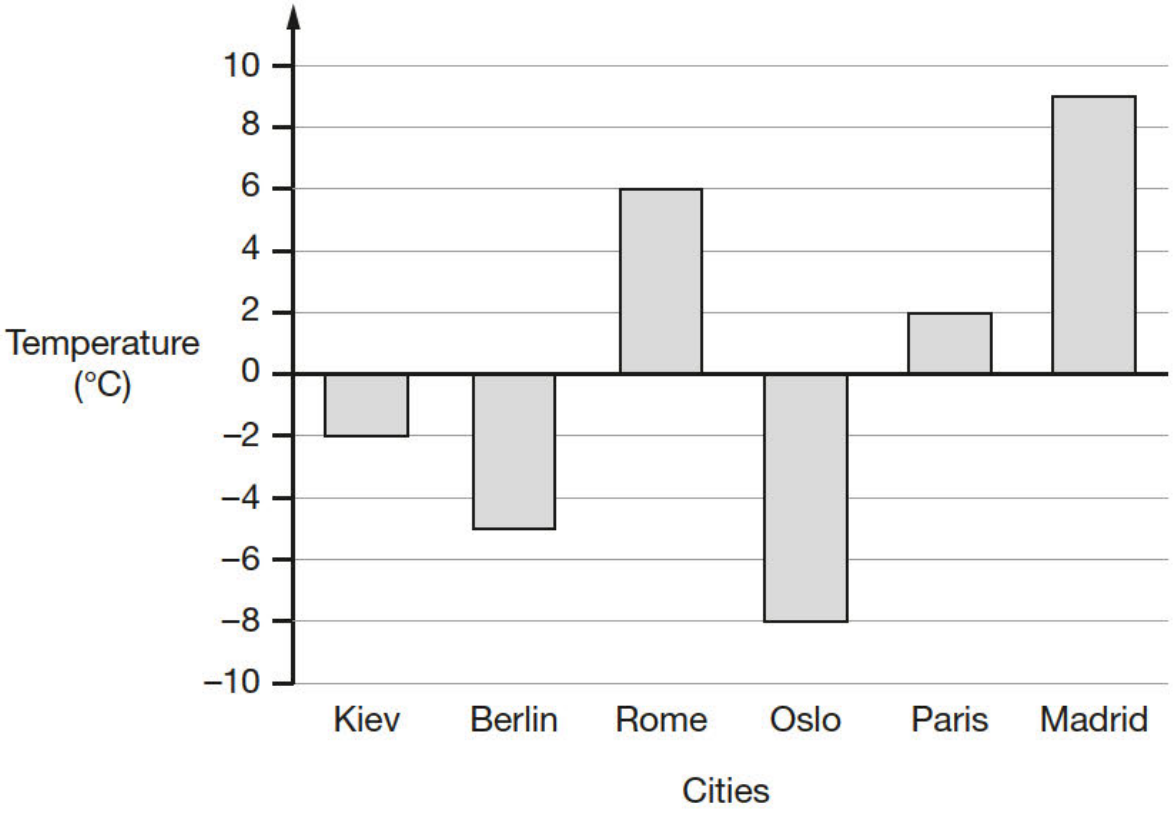
One is done for you.



3 marks

A1 for each correct line

8. This graph shows the temperature in six cities on one day in January.



Which city was 8 degrees warmer than Kiev?

Rome (A1)

1 mark

What was the <u>difference</u> between the temperature in Rome and the temperature in Oslo?

(-)14°C (A1)

1 mark

9.

I have a fair six-sided dice, numbered **4**, **9**, **12**, **16**, **20** and **24**

I am going to roll the dice.

(a) What is the probability of rolling a **multiple of 4**?

$\frac{5}{6}$ o.e.

1 mark

(b) What is the probability of rolling a **square number**?

$\frac{1}{2}$ o.e.

1 mark

10.

Write a **negative number** in the box to make the inequality correct.

$-3 <$ e.g.-2

1 mark

11. What sum?

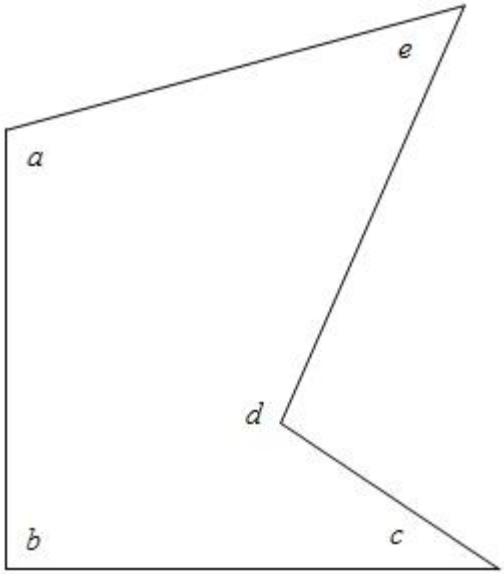
I'm thinking of a number. I work out the product of **8** and my number.

The answer is **24.** What is my number?

3 (A1)

1 mark

12.



Complete the following sentences.

Angle b is a **right angle.**

Angle c **or** e is an **acute** angle.

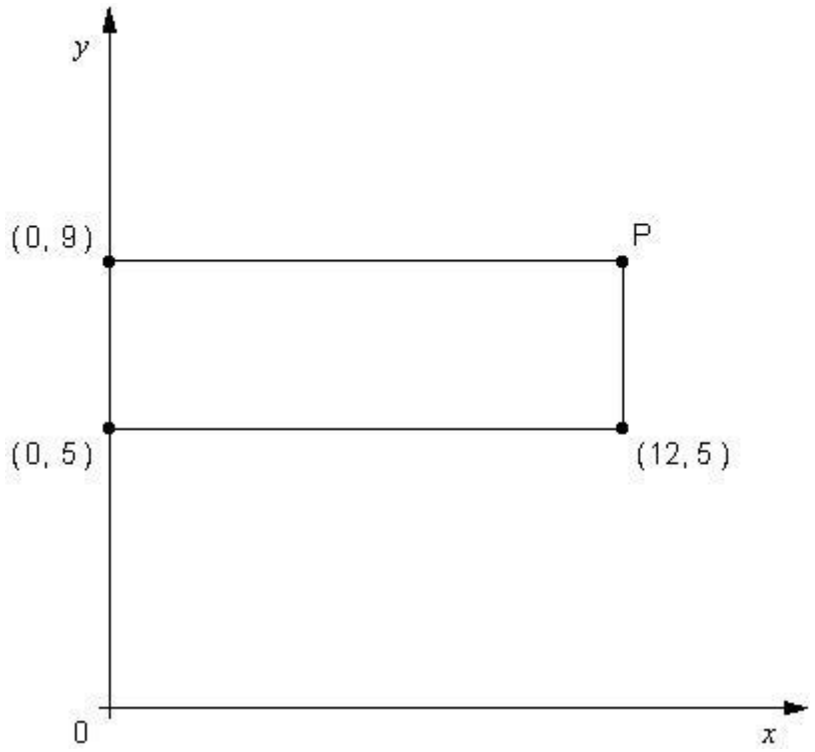
Angle a is an **obtuse** angle.

3 marks

A1 for each correct answer

13. Finding points

The graph shows a **rectangle**.



Not drawn accurately

Write the coordinates of point P

(12, 9) A1 for each

2 marks

14. Divisibility

(a) Tick (✓) all the numbers below that **divide by 5** with no remainder.

☐ 12 ☑ 15 ☐ 16 ☑ 20 ☑ 30

1 mark

(b) Tick (✓) all the numbers below that **divide by 3** with no remainder.

☑ 12 ☑ 15 ☐ 16 ☐ 20 ☑ 30

1 mark

(c) Tick (✓) all the numbers below that **divide by 15** with no remainder.

☐ 12 ☑ 15 ☐ 16 ☐ 20 ☑ 30

1 mark

15. Bicycles

In a survey, pupils were asked if they owned a bicycle.

Results:

$\frac{3}{8}$ of the pupils said **'Yes'**.

$\frac{5}{8}$ of the pupils said **'No'**.

46 more pupils said 'No' than said 'Yes'.

Altogether, how many pupils were in the survey?

$\frac{5}{8} - \frac{3}{8} = \frac{2}{8} = \frac{1}{4}$ (M1)

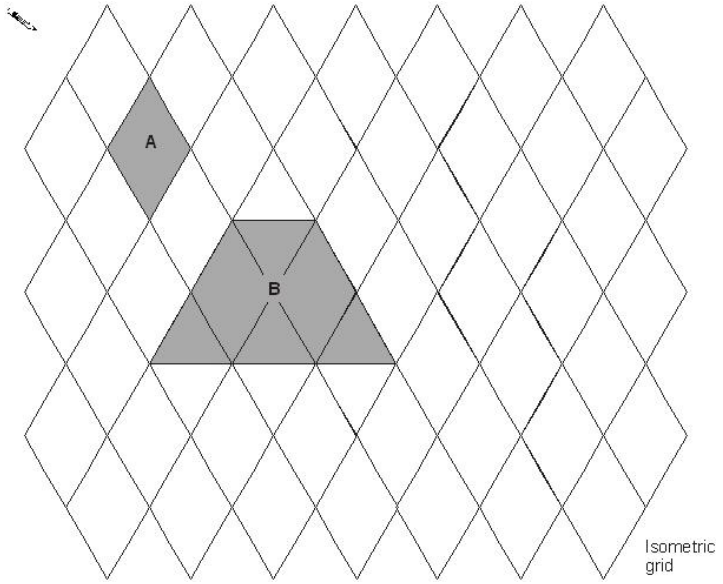
46×4 (M1)

184 (A1)

3 marks

16. Rhombus grid

Look at the shaded shapes.



(a) The area of shape **A** is **3cm²**

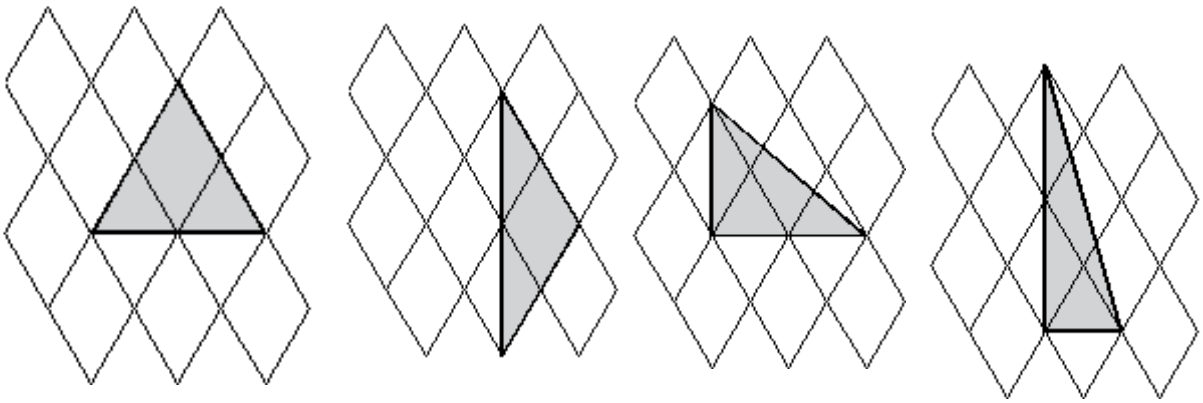
What is the area of shape **B**?

12 (A1) cm²

1 mark

(b) On the grid, draw a **triangle** that has an area of **6cm²**

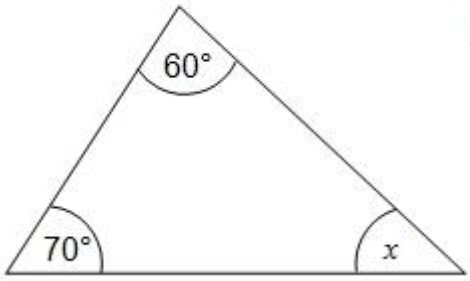
Examples:



1 mark

17. Angle facts

(a) Work out the size of the angle marked x



Not drawn accurately

70+60 = 130

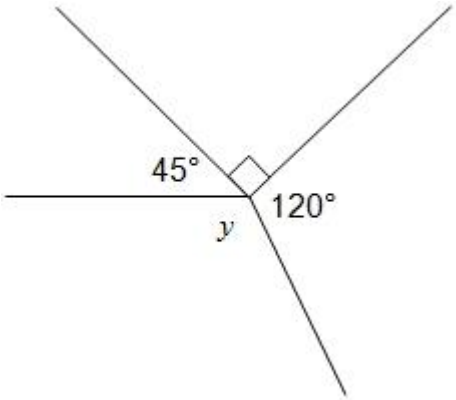
180- "their 130" or 180° seen (M1)

50 (A1)

..... degrees

2 marks

(b) Work out the size of the angle marked y



Not drawn accurately

45+90+120 = 255

360- "their 255" or 360° seen (M1)

105 (A1)

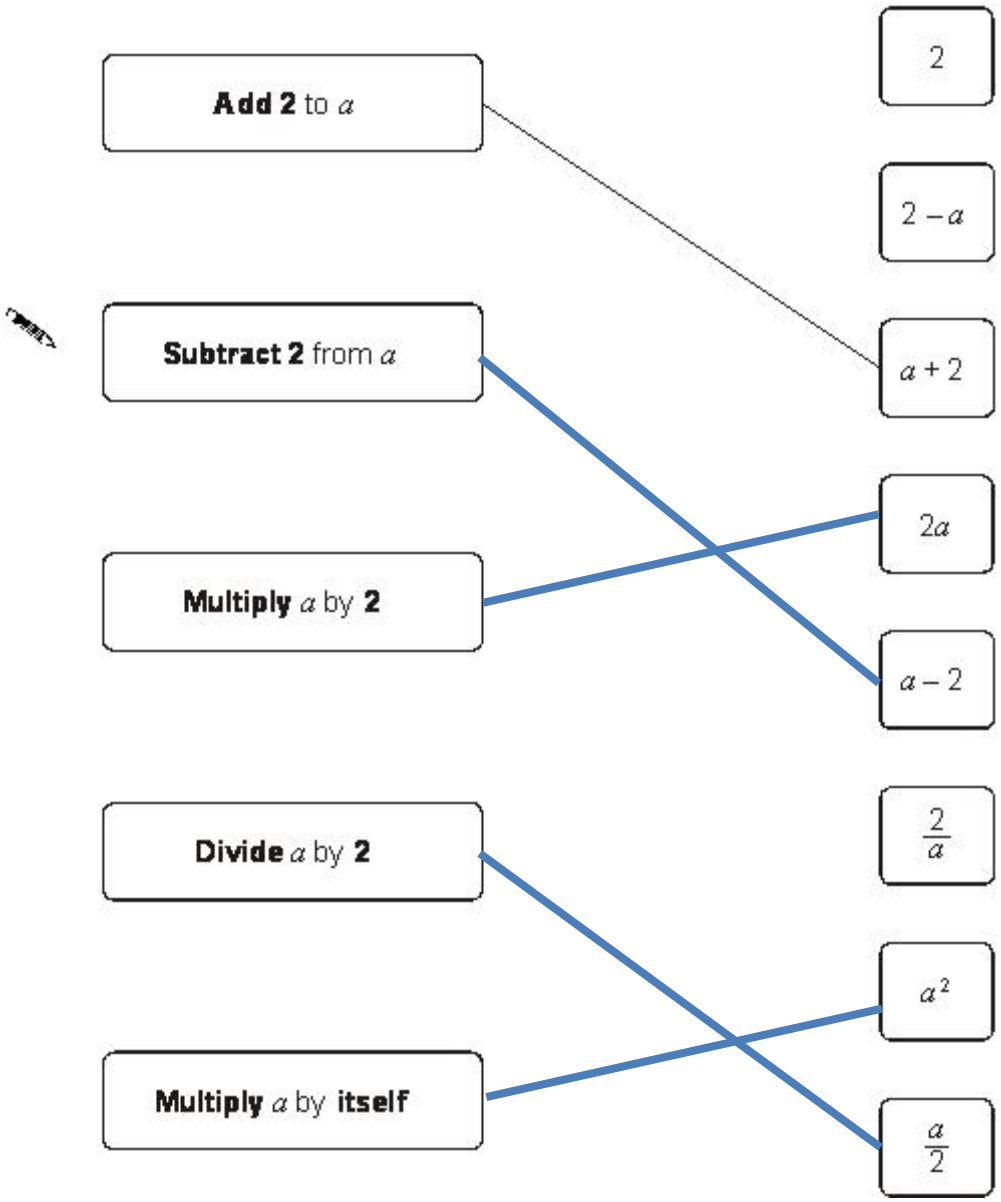
..... degrees

2 marks

18. Matching expressions

Match each statement to the correct expression.

The first one is done for you.

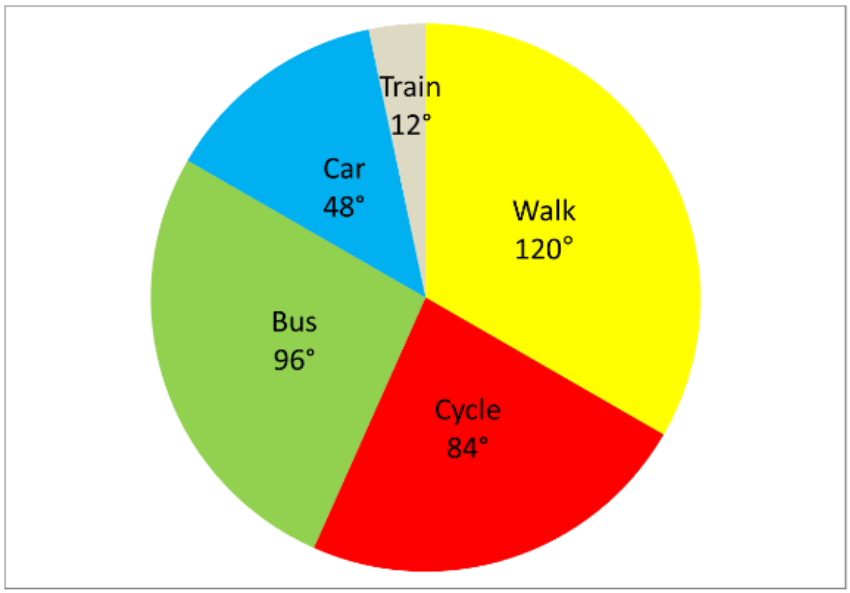


A1 for each correct line

4 marks

19. Two shapes

The pie chart below shows the chosen method of transport for **90 pupils** in year 7.



How many pupils chose to **walk** to school?

$\frac{120}{360} = \frac{1}{3}$

$\frac{1}{3}$ seen (B1)

30 pupils (A1)

.....

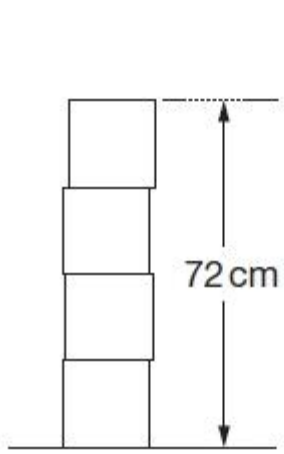
2 marks

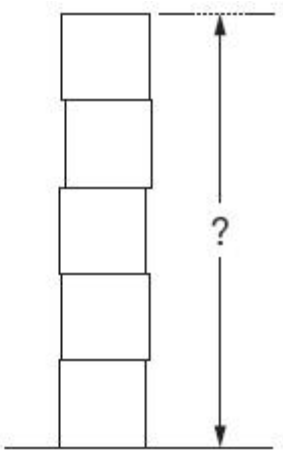
20. Boxes

Lisa has some boxes that are all cubes of the same size.

She uses four of the boxes to make a pile with a height of **72 cm**.

She puts one more box on top of the pile.





Work out the height of the pile of **five** boxes.

$72 \div 4 = 18$ (M1)

18 x 5 (M1)

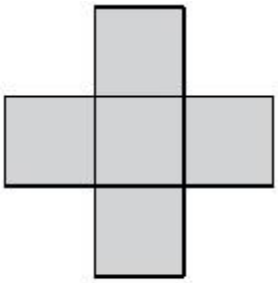
90 (A1)

..... cm

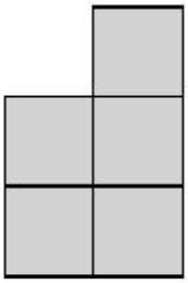
3 marks

21. Two shapes

Shape A and shape B are each made from five identical squares.



A



B

Not drawn accurately

The **perimeter** of shape A is **72cm**.

Work out the **perimeter** of shape B.

72 ÷ 12 = 6 (M1 for attempt to work out side length of a square)

6 x 10 (M1)

60 (A1) .....

3 marks

22. Pencils and rulers

Nadia has £5 to buy pencils and rulers.

Prices	
Pencils	8p each
Rulers	30p each

She says,

"I will buy 15 pencils.
Then I will buy as many rulers as possible."

How many rulers does she buy?

15 x 8p = £1.20 (M1)

£5 – £1.20 = £3.80 (M1)

£3.80 ÷ 30p

12 (A1) ..... rulers

3 marks

23. Function Machine

Here is a number machine.

Complete this table for the number machine.

Input	Output
0.5	-12
2	15
3	33
3	33

A1 for each

3 marks

24. Number grid

The numbers 1 to 12 are put in a grid.

2, 4, 5, 7, 10 and 12 are shown.

3	8	5	10
12			9
4			1
7	11	2	6

Each of the four sides of the grid must add up to 26

Complete the grid using the numbers

1, 3, 6, 8, 9 and 11

NOTE: 1 and 9 can be in either order

B2 for three sides adding to 26 using the given numbers with no repeats across the three sides

B1 for one or two sides adding to 26 using the given numbers with no repeats across the one or two sides

3 marks

25. Sums of squares

Exactly one of these statements is correct. Which one?

Circle the correct answer:

A $44^2 + 77^2 = 4477$ B $55^2 + 66^2 = 5566$ C $66^2 + 55^2 = 6655$

D $88^2 + 33^2 = 8833$ E $99^2 + 22^2 = 9922$

A3 if correct answer chosen

D Statements such as those in this question may sometimes be shown to be false by considering the units digit of the expressions on each side. The units digit of $44^2 + 77^2$ is 5; the units digit of $55^2 + 66^2$ and hence also of $66^2 + 55^2$ is 1; the units digit of $88^2 + 33^2$ is 3 and that of $99^2 + 22^2$ is 5. So four of the statements are definitely false. It remains to check that $88^2 + 33^2 = 7744 + 1089 = 8833$.

Recognising last digit of a squared value or good attempt to square values M1

Attempt to add values or work out last digit of answer M1

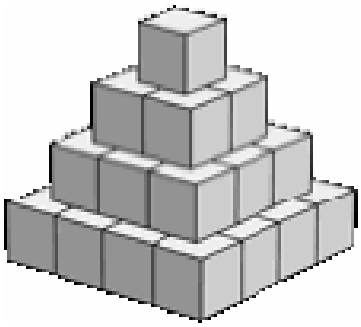
OR

Award method marks for eliminating incorrect answers if working is seen

3 marks

26. Pyramid

The diagram shows a pyramid made up of 30 cubes, each measuring 1m × 1m × 1m.



What is the total surface area of the entire pyramid, including its base?

Circle the correct answer:

A 30 m^2 B 62 m^2 C 72 m^2 D 152 m^2 E 180 m^2

A2 if correct answer is chosen

C When the pyramid is viewed from above, it can be seen that the total area of the horizontal part of the surface of the pyramid (excluding its base) is the same as that of a square of side 4 metres, that is 16 m^2. The area of the base of the pyramid is also 16 m^2. Finally the total area of the vertical part of the pyramid is equal to $(4 \times 1 + 4 \times 2 + 4 \times 3 + 4 \times 4)\ m^2 = 40\ m^2$. So the total surface area of the pyramid is $(16 + 16 + 40)\ m^2 = 72\ m^2$.

Award M1 for any suitable method (use guidance above)

2 marks

Total 85 Marks