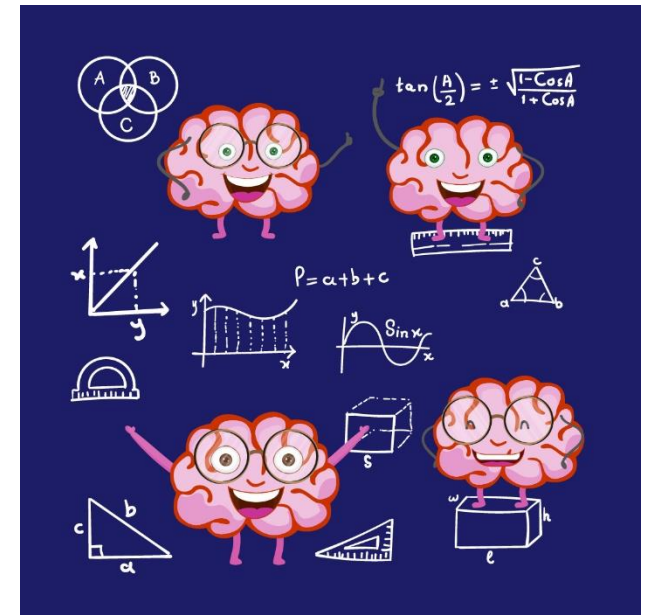


The Herts for Learning 2021 Year 5 Mathematics Challenge

Question and Answer Pack



- 3 rounds of 6 questions
- 60 marks for each round
- plus memory round
- total of 240 marks

Round 1

**General
Mathematics
Questions**

The same digit is hidden by the paint splodges. What is the digit?

$$23 \text{ [splotch]} \times 6 = 1 \text{ [splotch]} 0 \text{ [splotch]}$$

Ellen is thinking of a whole number.

She **multiplies** it by 4.

Then she **subtracts** 12.

$\frac{1}{3}$ of this number is now 8.

What number did Ellen **first** think of?

Order these calculations from **smallest** to **largest** answer *e.g. A B C D*

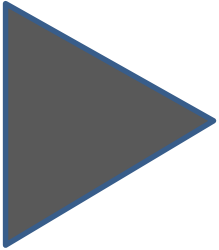
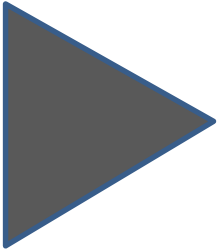
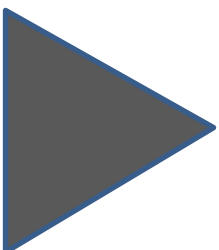
a) $37.5 \div 15 =$

b) $2.1 \times 1.2 =$

c) $213.4 - 117.6 - 93.36 =$

d) $1.23 + 0.3 + 0.96 =$

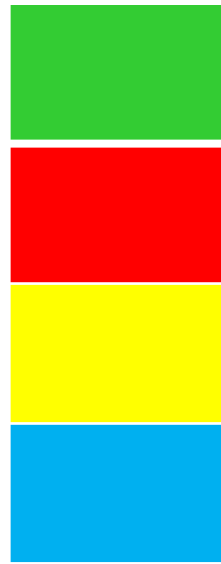
Which 'chain' ends in the lowest value?

A	Start 50	÷ 5	- 3	Treble it	½ of it		End ?
B	Start 1.25	x 4	+ 183	¼ of it	÷ 5		End ?
C	Start 31.8	+ 5.2	÷ 4	- 0.75	x 1.1		End ?

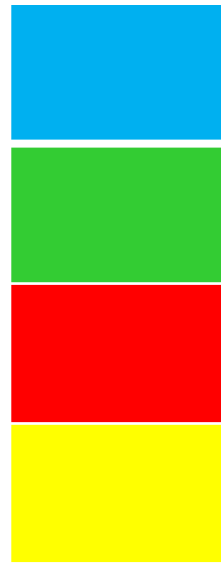
Round 1

Question 5

Here is a sequence of the first four towers.



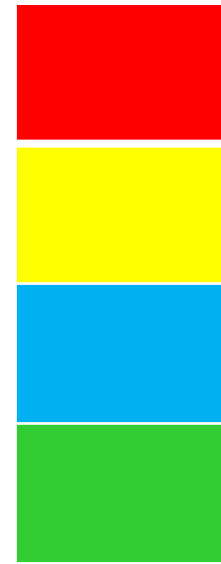
1.



2.



3.



4.

If it continued,
what would the
19th tower look
like?

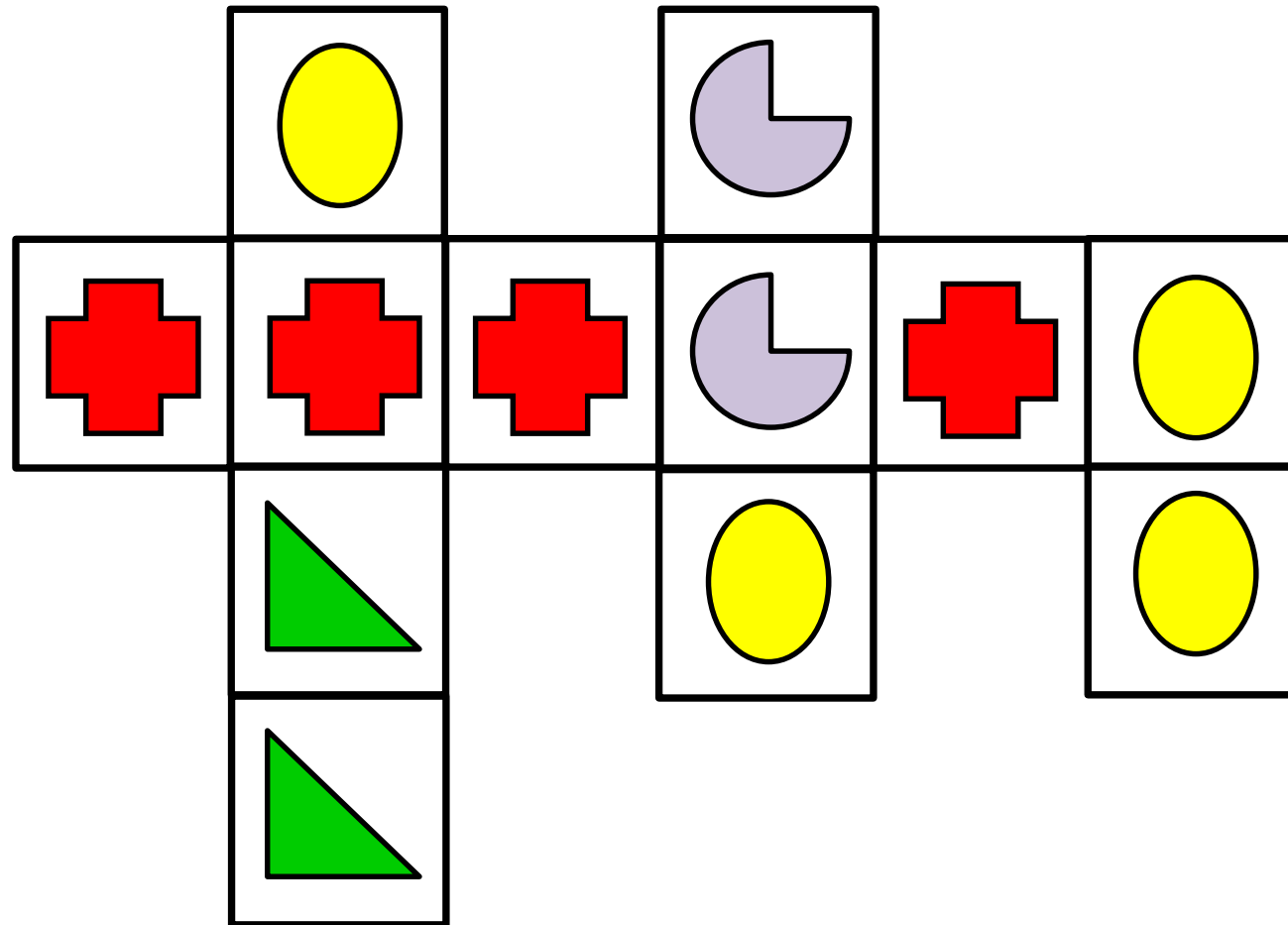


Round 1

Question 6

Each column and row has a value of 48.

What is the value of ?



Answers to Round 1

Round 1

Question 1

The same digit is hidden by the paint splodges. What is the digit?

$$23\underline{4} \times 6 = 1\underline{4}0\underline{4}$$

Ellen is thinking of a whole number.

She **multiplies** it by 4.

Then she **subtracts** 12.

$\frac{1}{3}$ of this number is now 8.

What number did Ellen **first** think of? **9**

Order these calculations from **smallest** to **largest** answer *e.g. A B C D*

a) $37.5 \div 15 = 2.5$

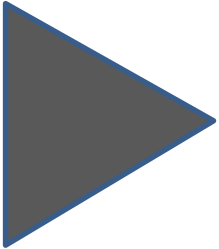
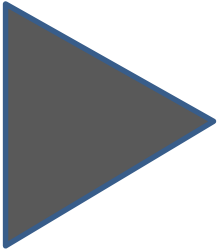
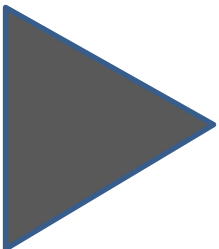
b) $2.1 \times 1.2 = 2.52$

c) $213.4 - 117.6 - 93.36 = 2.44$

d) $1.23 + 0.3 + 0.96 = 2.49$

ANSWER = C D A B

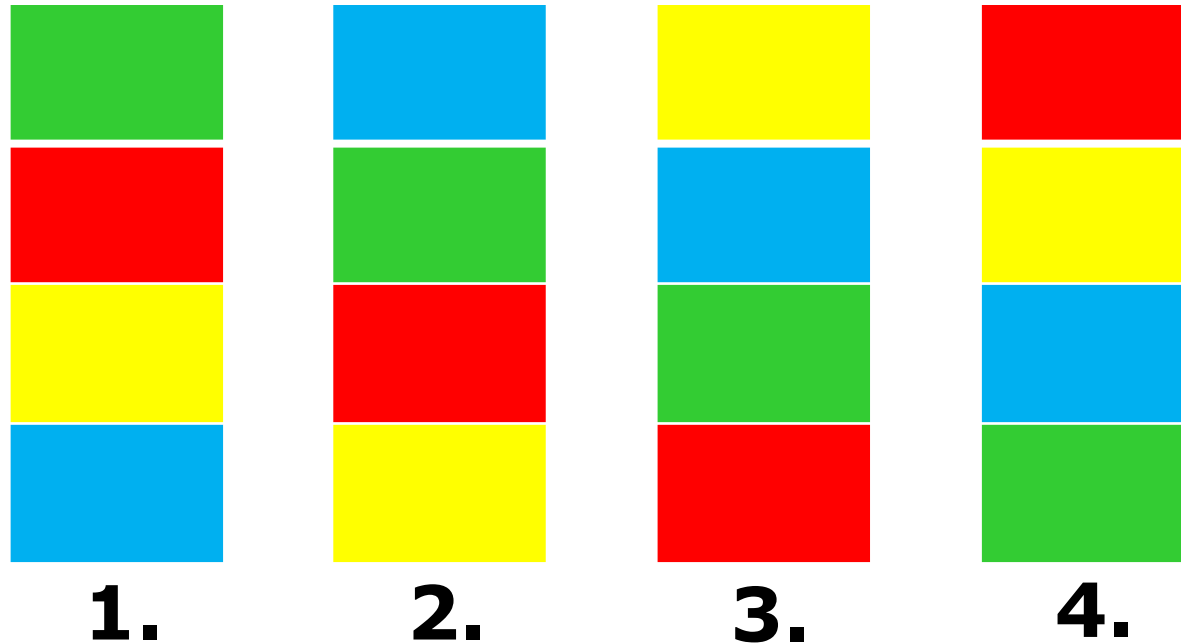
Which 'chain' ends in the lowest value?

A	Start 50	$\div 5$	$- 3$	Treble it	$\frac{1}{2}$ of it		End 10.5
B	Start 1.25	$\times 4$	$+ 183$	$\frac{1}{4}$ of it	$\div 5$		End 9.4
C	Start 31.8	$+ 5.2$	$\div 4$	$- 0.75$	$\times 1.1$		End 9.35

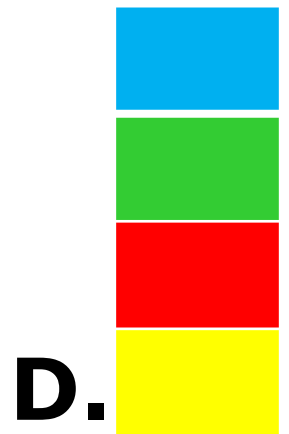
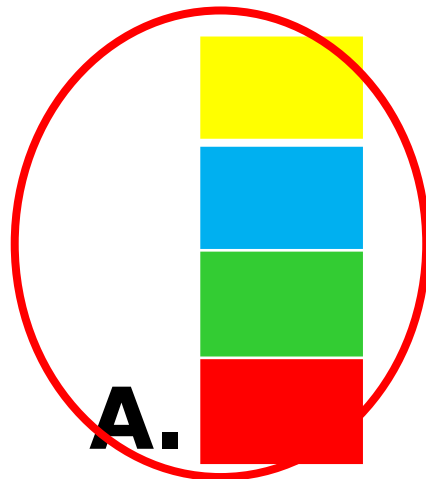
Round 1

Question 5

Here is a sequence of the first four towers.



If it continued, what would the 19th tower look like?

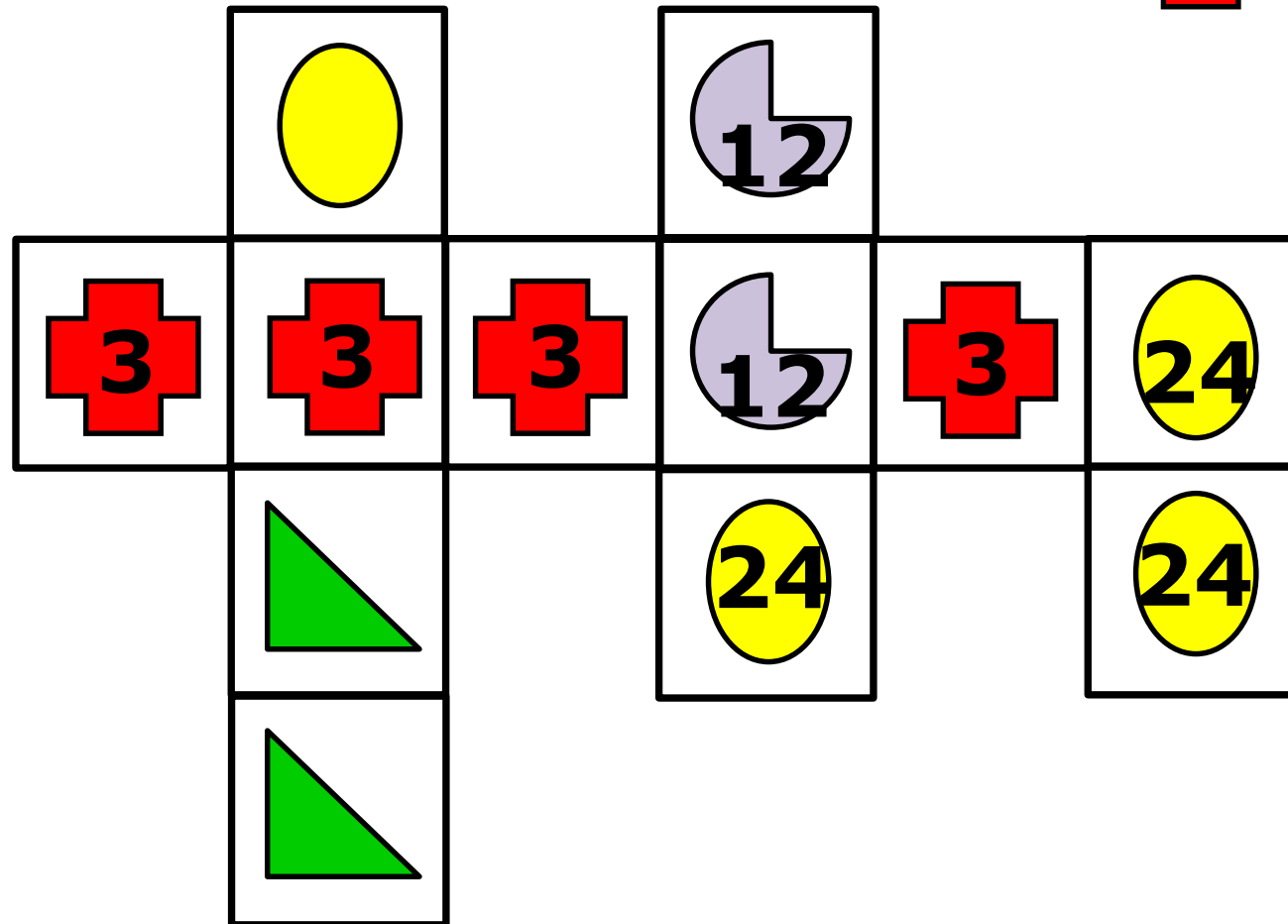


Round 1

Question 6

Each column and row has a value of 48.

What is the value of  ?



Round 2

**Estimation
Round
Questions**

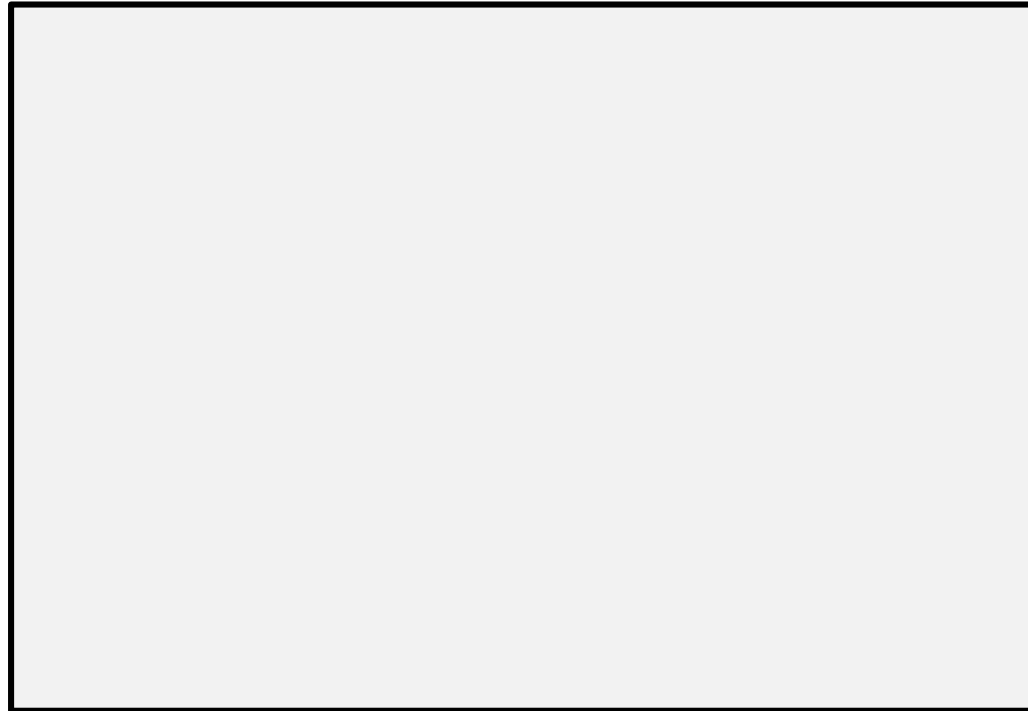
In millilitres, what is the total volume of paint in the 4 tins?



Round 2

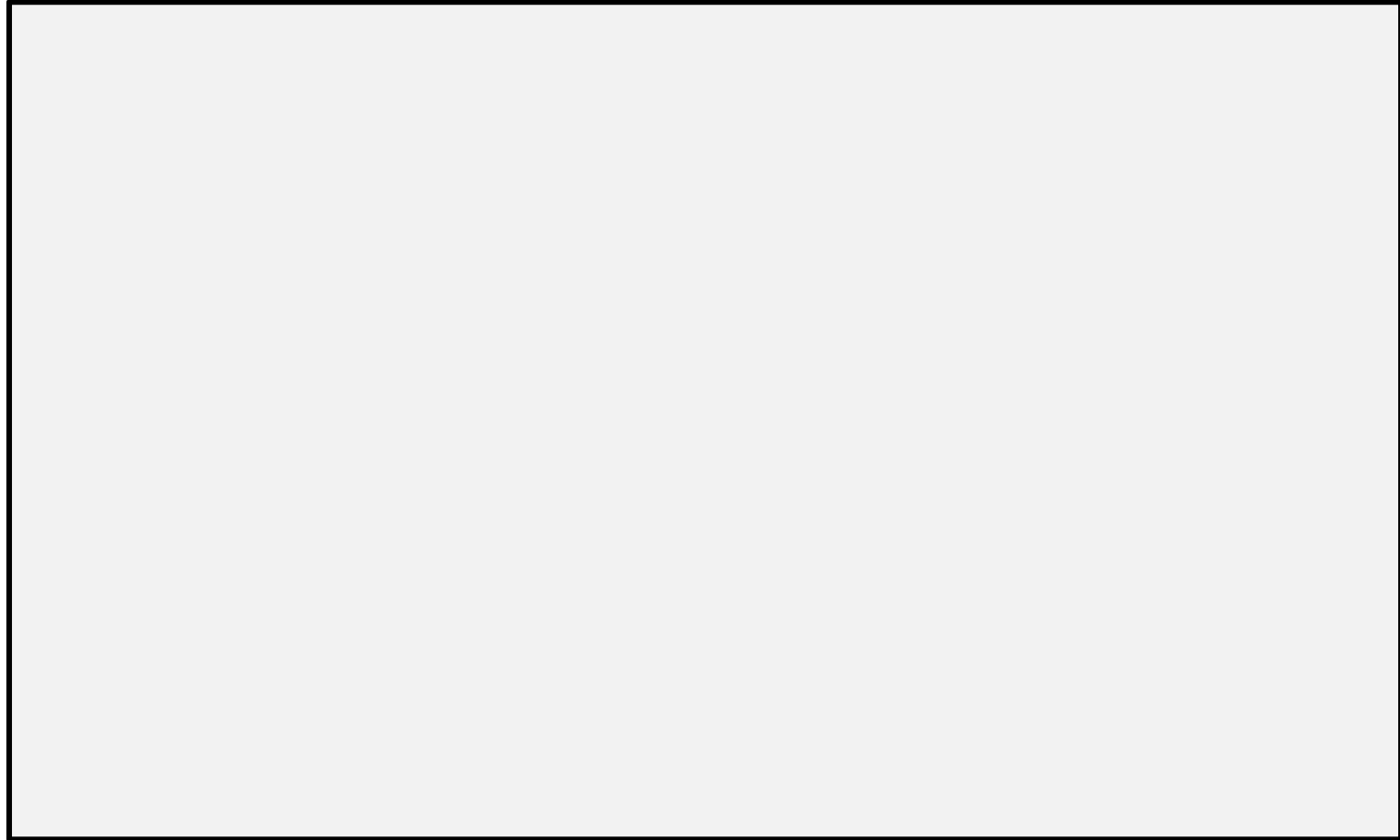
Question 2

If the smaller shape has an area of "3",
what is the area of the rectangle?



Round 2

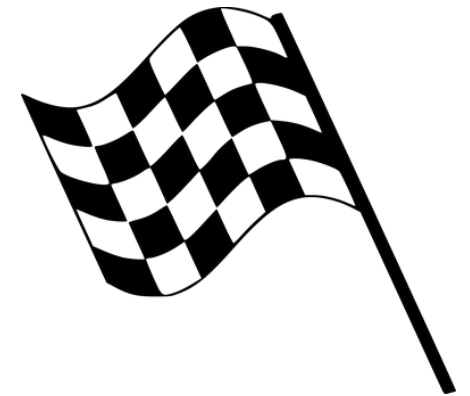
Question 2

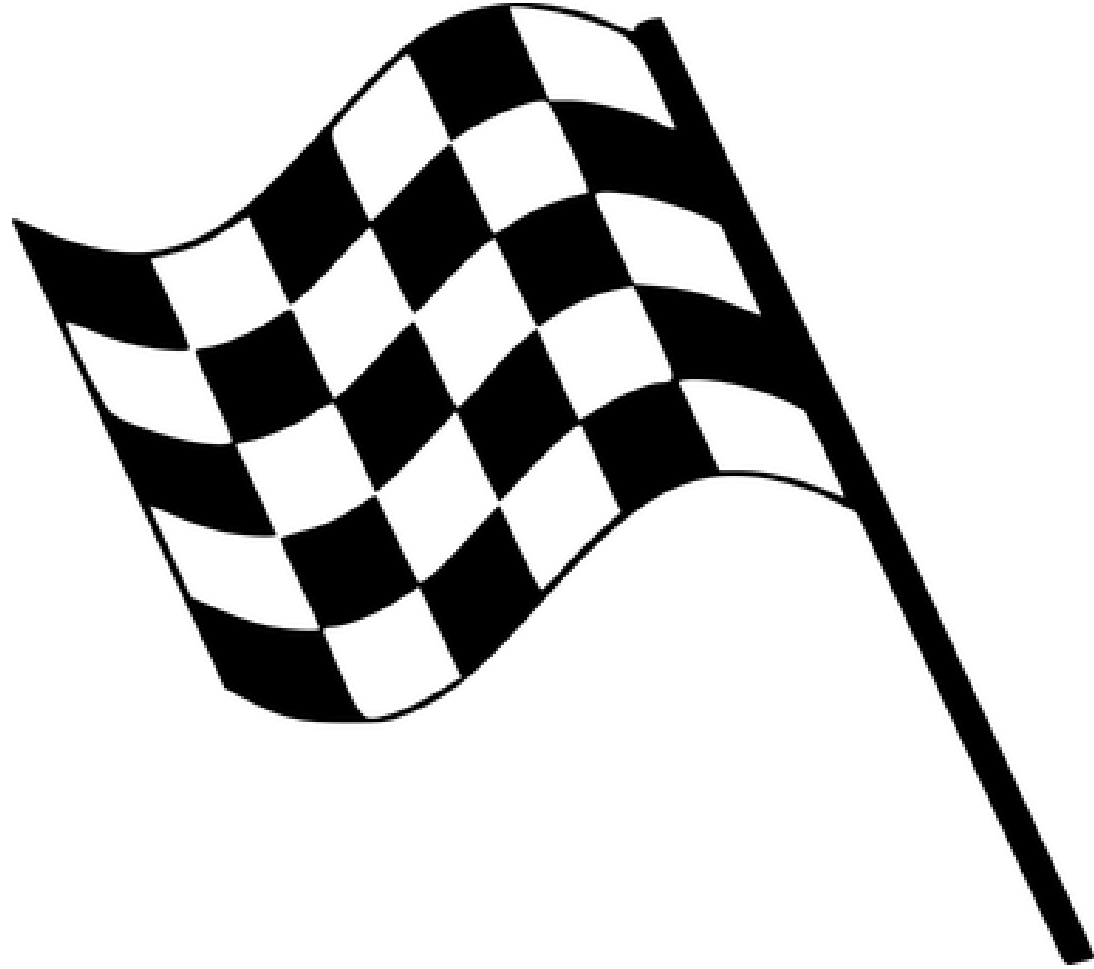


Here is a chequered flag.

It will disappear and then
re-appear.

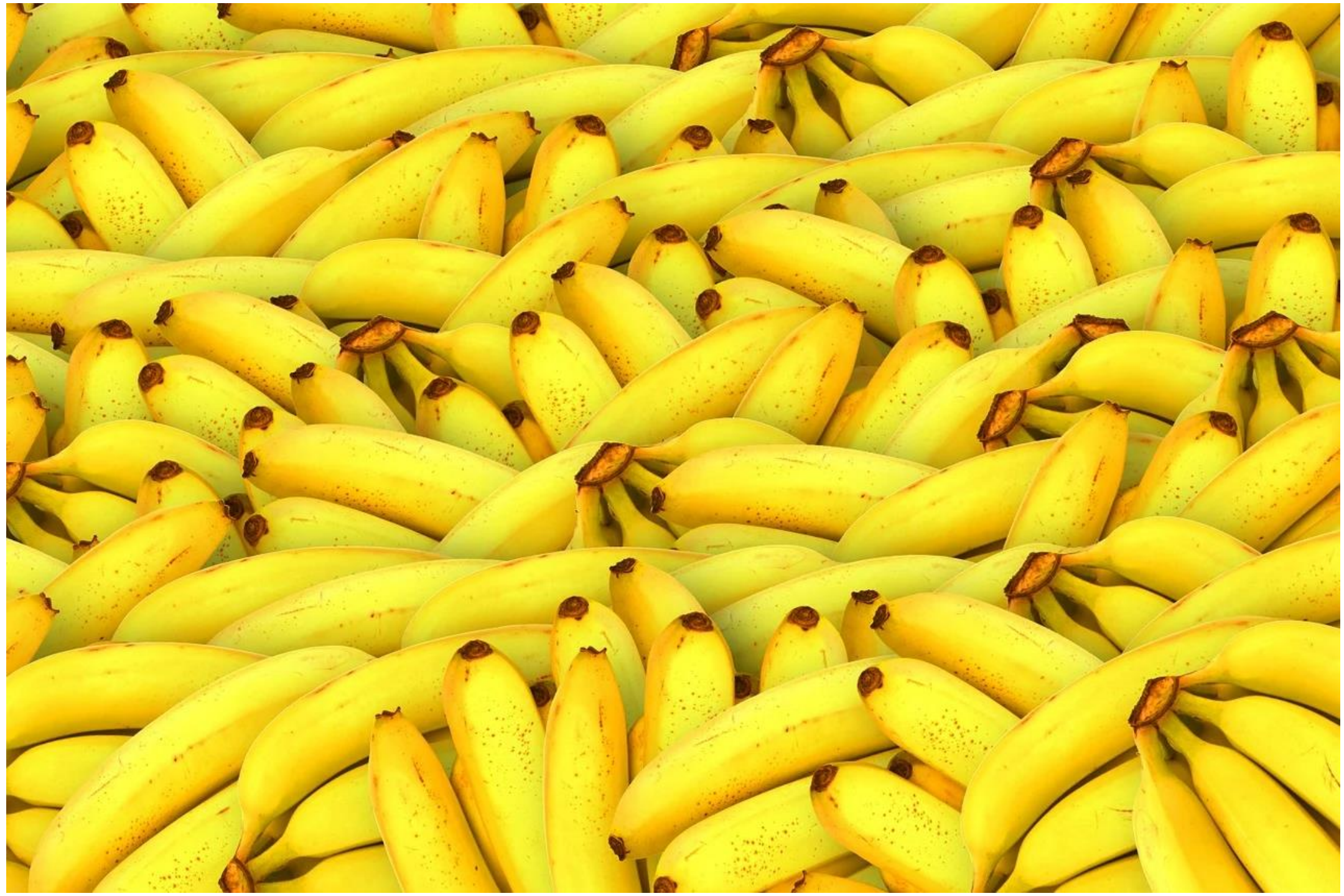
To the nearest second,
estimate for how long it
disappears.





Approximately, how many bananas are there?



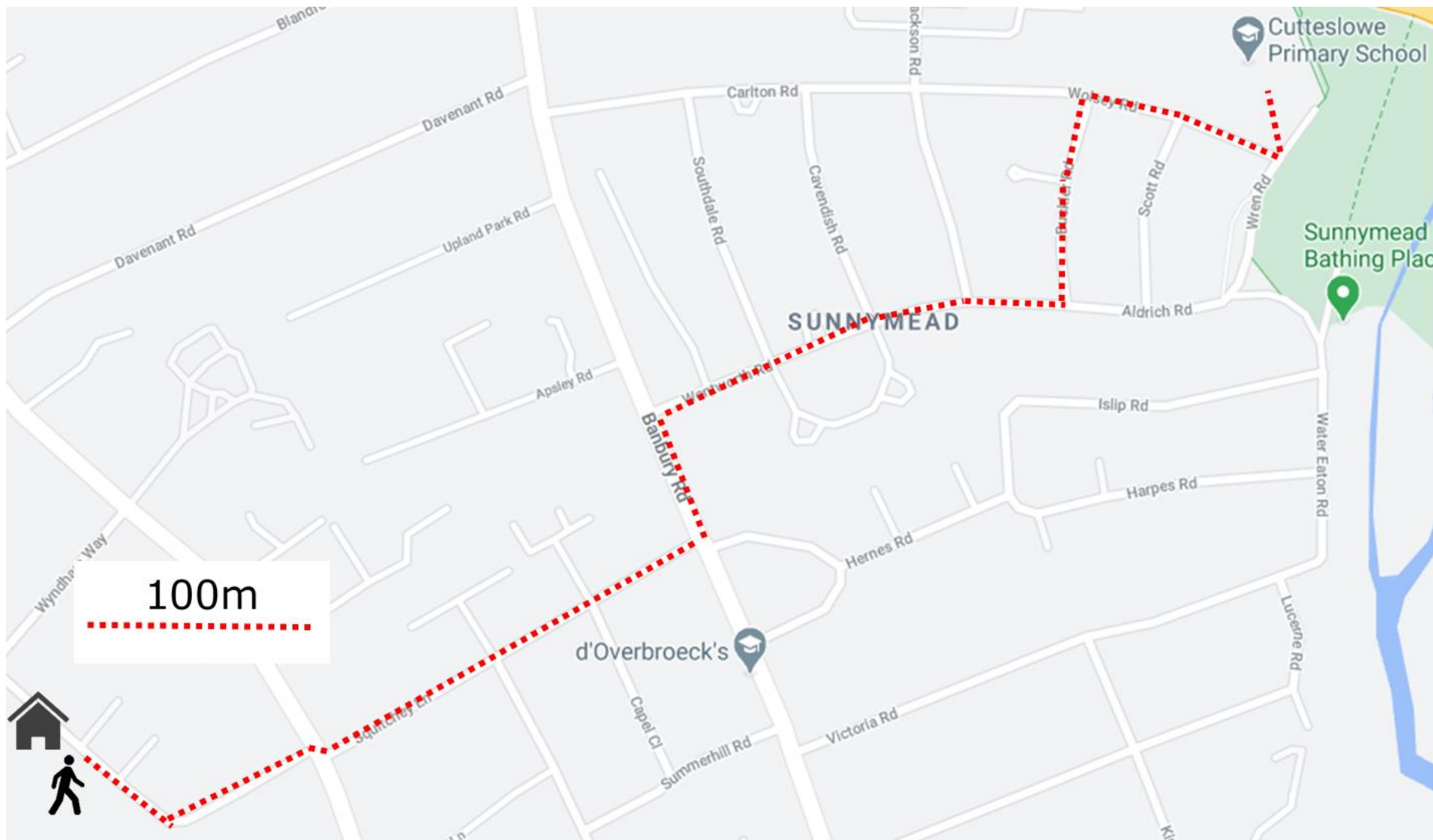


R.2

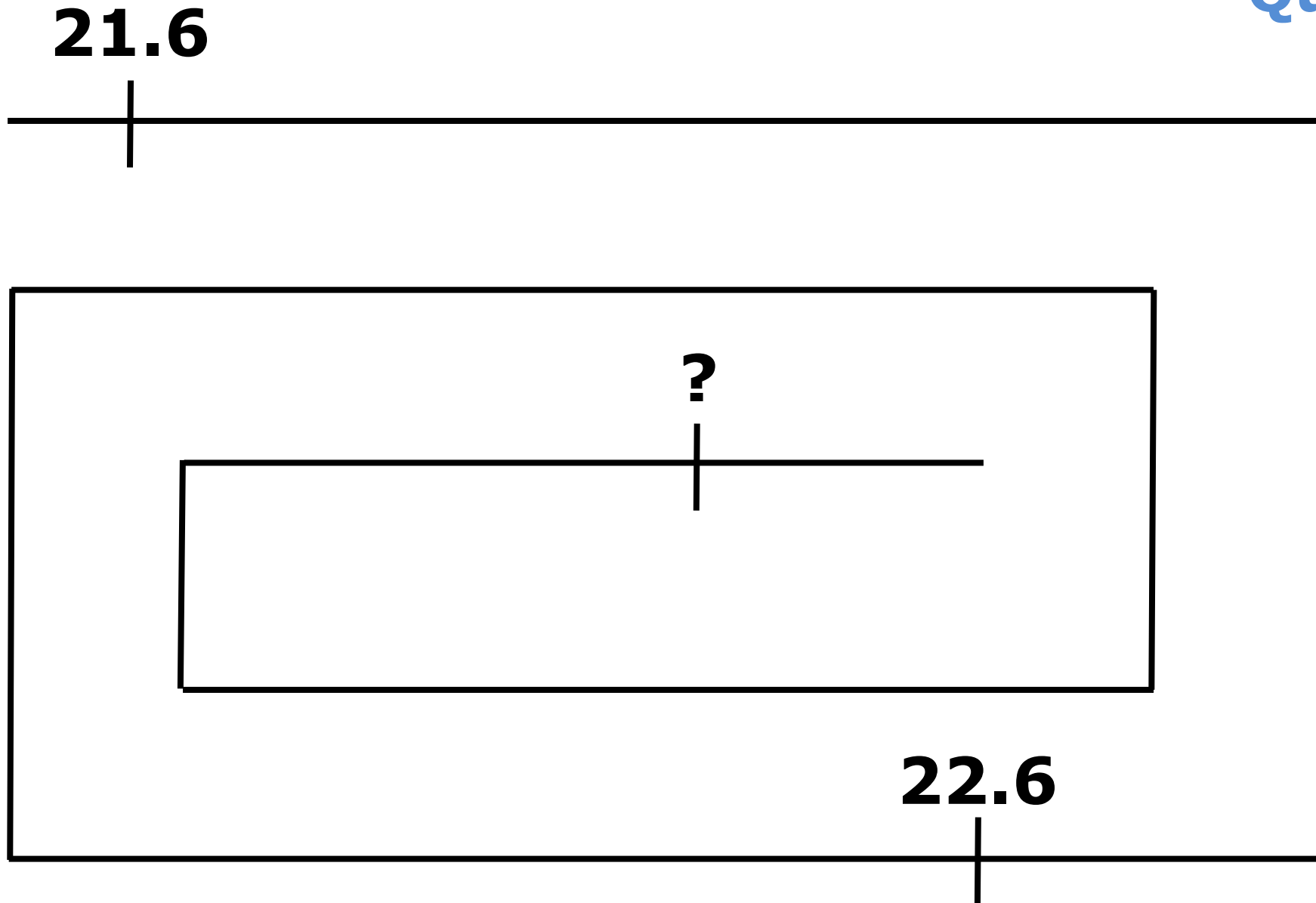
Q. 5

Tom takes 90 seconds to walk 100m.

How long does it take him to walk to school?



What number is represented by the
'?' on this number line?



Answers to Round 2

Round 2

Question 1

In **millilitres**, what is the **total volume** of paint in the 4 tins?



1 litre = 1000ml
500ml 250ml 125ml

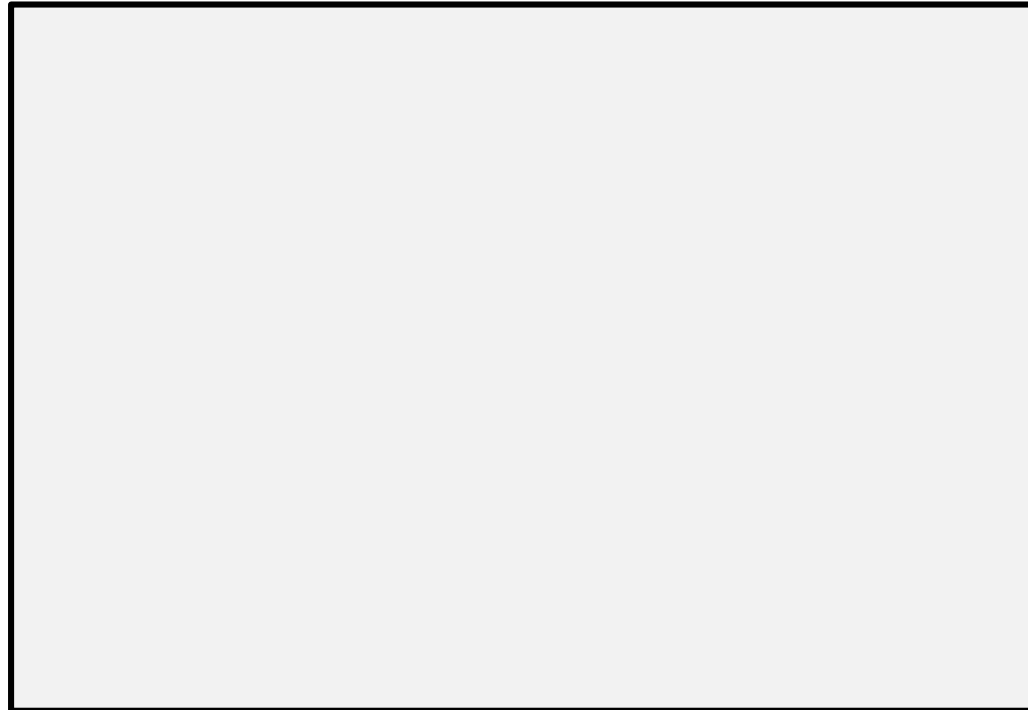
Exact answer = 1875ml

Marks	Min. value	Max. value
10	1800	2000
9	1750	2050
8	1700	2100
7	1650	2150
6	1600	2200
5	1550	2250
4	1500	2300
3	1450	2350
2	1400	2400
1	1350	2450

Round 2

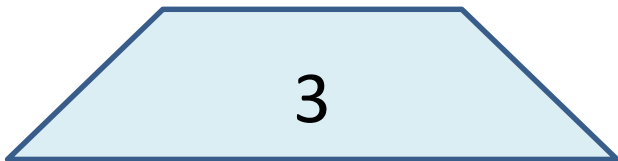
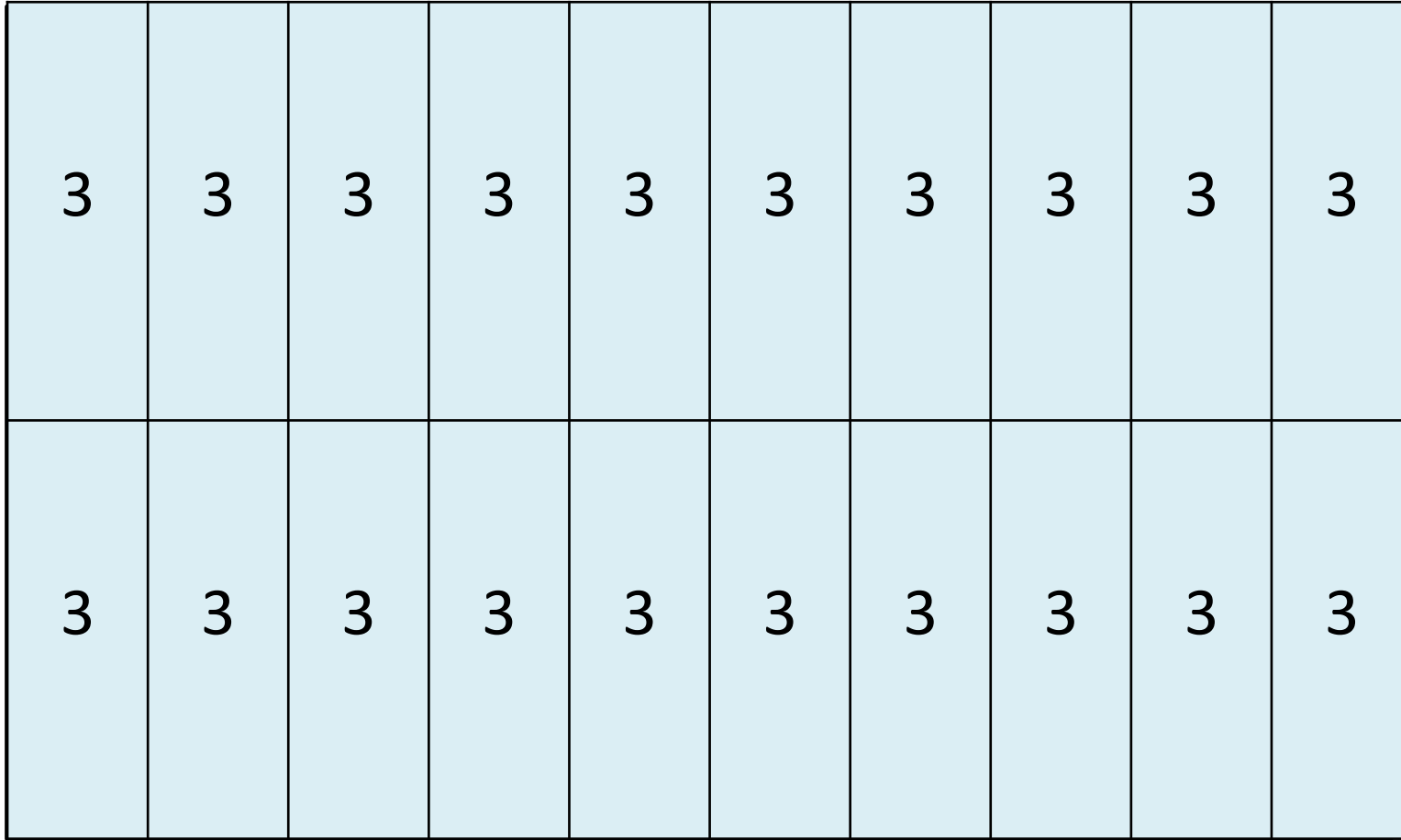
Question 2

If the smaller shape has an area of "3",
what is the area of the rectangle?



Round 2

20 smaller shapes



=



Question 2

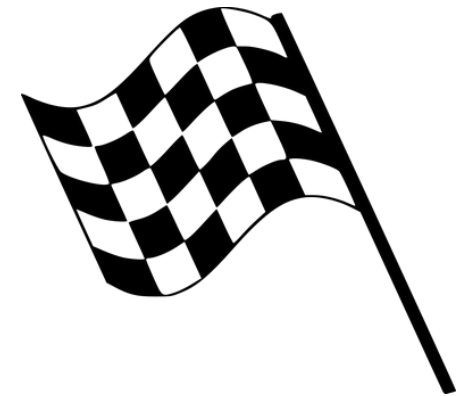
Exact answer = 60

Marks	Min. value	Max. value
10	57	63
9	55.5	64.5
8	54	66
7	52.5	67.5
6	51	69
5	49.5	70.5
4	48	72
3	46.5	73.5
2	45	75
1	43.5	76.5

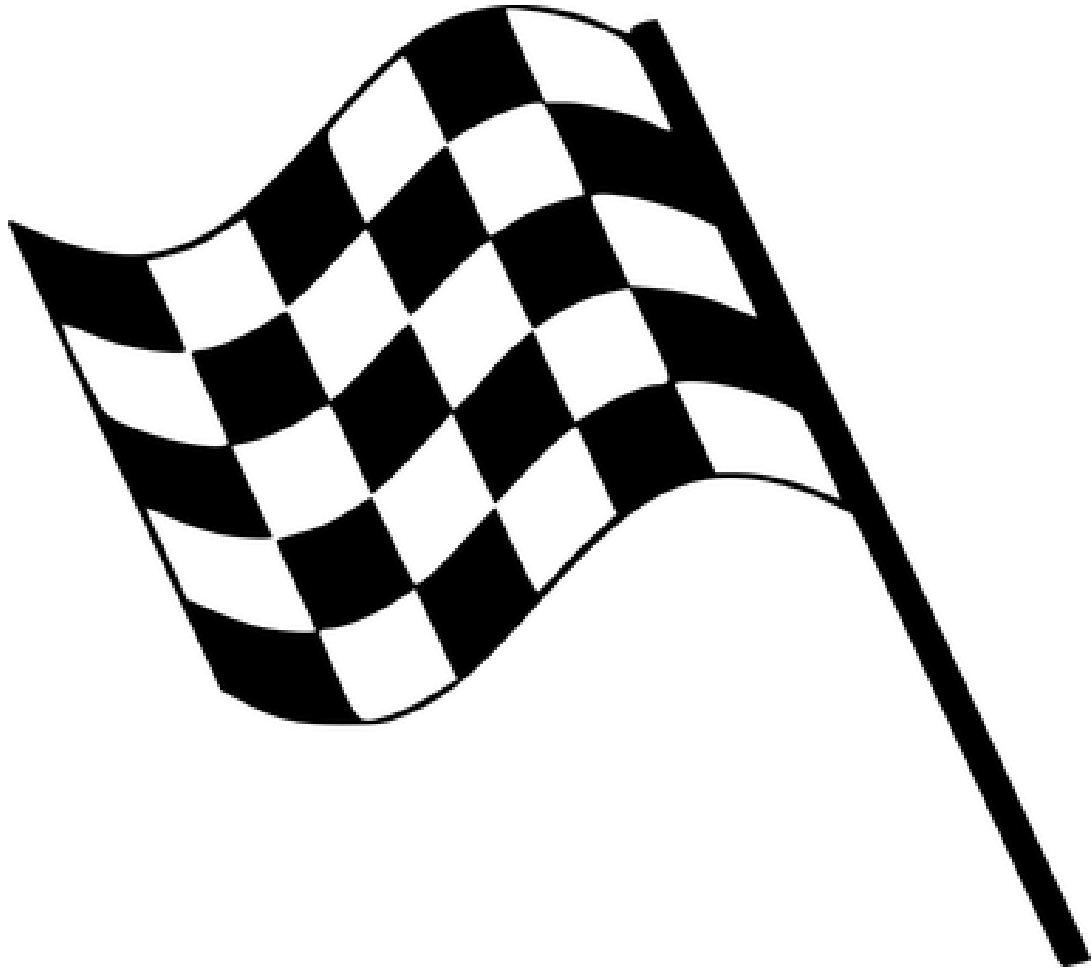
Here is a chequered flag.

It will disappear and then
re-appear.

To the nearest second,
estimate for how long it
disappears.



Exact answer = 46 seconds



Marks	Min. value	Max. value
10	45	47
9	44.5	47.5
8	44	48
7	43.5	48.5
6	43	49
5	42.5	49.5
4	42	50
3	41.5	50.5
2	41	51
1	40.5	51.5

Round 2

Approximately, how many bananas are there?



Question 4

Exact answer = 155

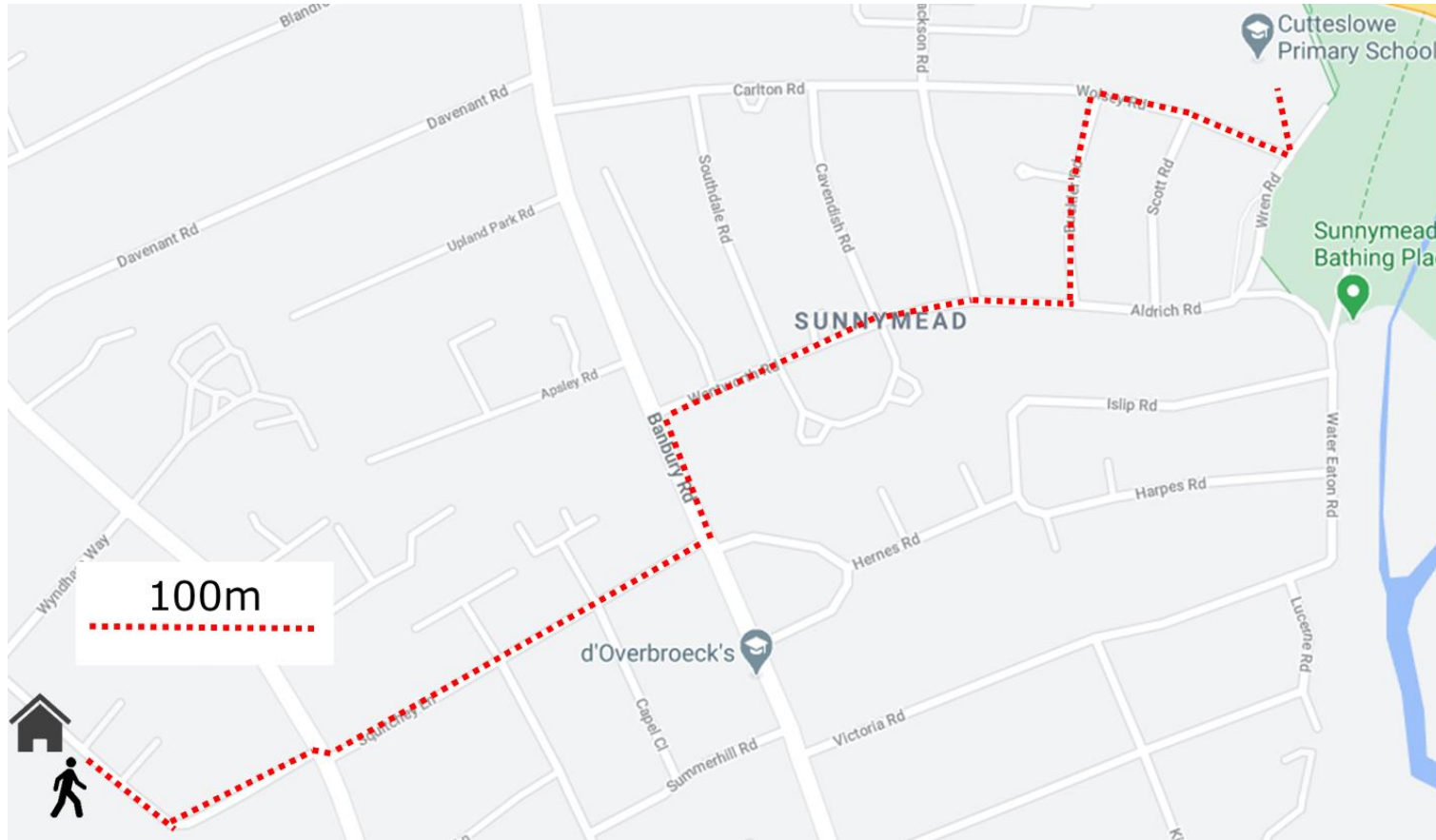
Marks	Min. value	Max. value
10	150	160
9	147.5	162.5
8	145	165
7	142.5	167.5
6	140	170
5	137.5	172.5
4	135	175
3	132.5	177.5
2	130	180
1	127.5	182.5

R.2

Q. 5

Exact answer = 630 seconds

Tom takes 90 seconds to walk 100m.
How long does it take him to walk to school?

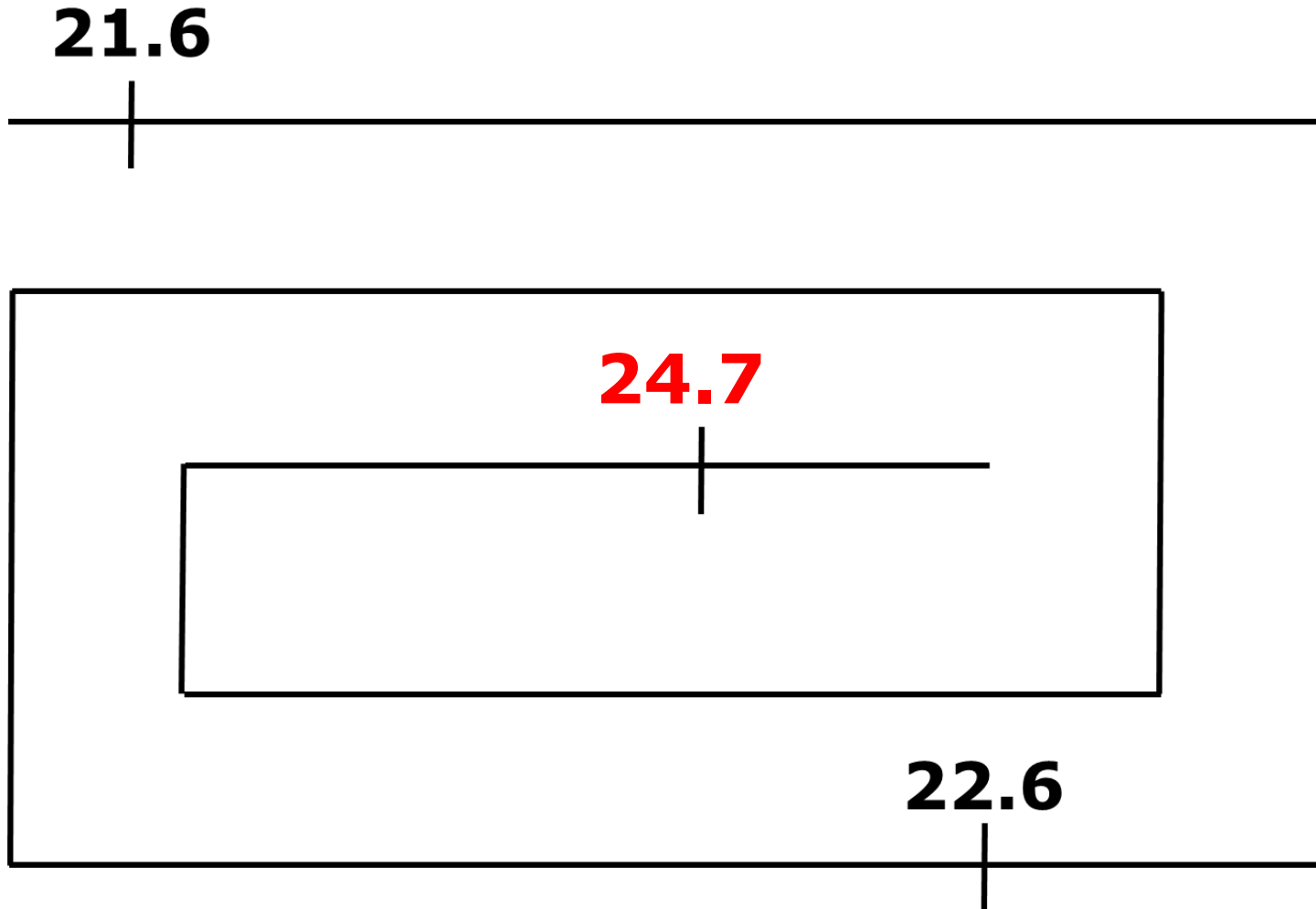


Marks	Min. value	Max. value
10	615	645
9	607.5	652.5
8	600	660
7	592.5	667.5
6	585	675
5	577.5	682.5
4	570	690
3	562.5	697.5
2	555	705
1	547.5	712.5

Round 2

Question 6

What number is represented by the '?' on this number line?



Marks	Min. value	Max. value
10	24.5	24.9
9	24.4	25.0
8	24.3	25.1
7	24.2	25.2
6	24.1	25.3
5	24.0	25.4
4	23.9	25.5
3	23.8	25.6
2	23.7	25.7
1	23.6	25.8

Round 3

Memory Round

Length, Area and Volume

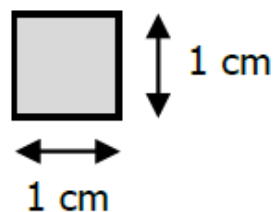
The word **metre** comes from ancient Greek (*metreo* = "to measure")

1000 m	1 kilometre (km)
100 m	1 hectometre (hm)
10 m	1 decametre (dam)
1 m	1 metre (m)
0.1 m	1 decimetre (dm)
0.01 m	1 centimetre (cm)
0.001 m	1 millimetre (mm)

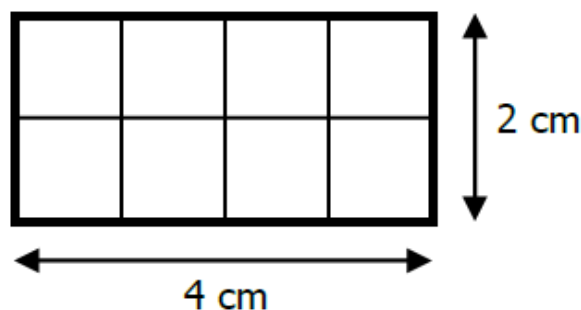
The distance from the North Pole to the Equator is exactly 1 billion centimetres.

Some old-fashioned units of length:
inch, foot, yard, mile, furlong

Here is a square centimetre (1 cm^2)



This rectangle is made from 8 of these squares.

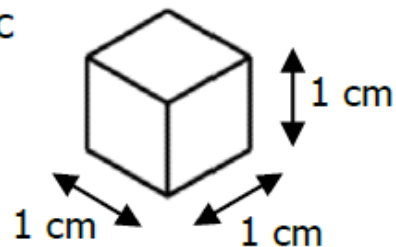


It has an area of **8 cm^2** .

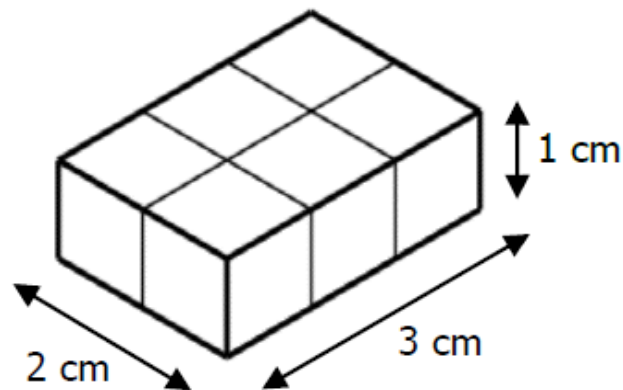
Before metric units, area was sometimes measured in:

1 square inch $\approx 6.45 \text{ cm}^2$
1 acre $\approx 4,050 \text{ m}^2$

Here is a cubic centimetre (1 cm^3)



This cuboid is made out of 6 of these cubes.



It has a volume of **6 cm^3** .

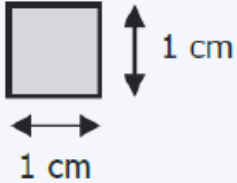
1 litre = $1,000 \text{ cm}^3$
1 m^3 (cubic metre) =
1,000 litres or $1,000,000 \text{ cm}^3$

Length, Area and Volume

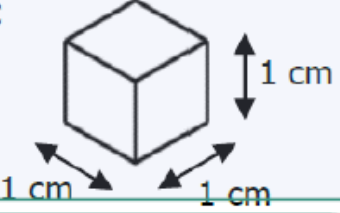
5 marks each

The word **metre** comes from ancient Greek (*metreo* = "to measure")

Here is a square centimetre (1 cm^2)



Here is a cubic centimetre (1 cm^3)

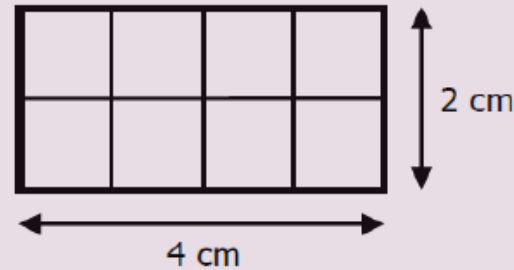


10 marks each

1000 m	1 kilometre (km)
100 m	1 hectometre (hm)
10 m	1 decametre (dam)
1 m	1 metre (m)
0.1 m	1 decimetre (dm)
0.01 m	1 centimetre (cm)
0.001 m	1 millimetre (mm)

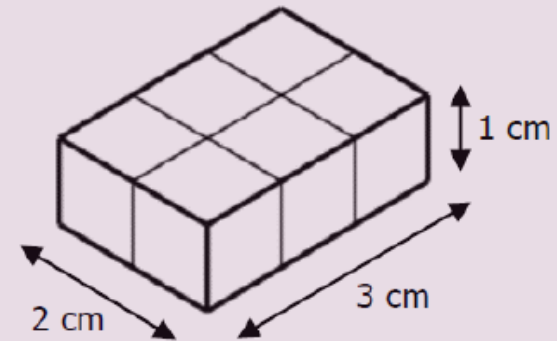
The distance from the North Pole to the Equator is exactly 1 billion centimetres.

This rectangle is made from 8 of these squares.



It has an area of 8 cm^2 .

This cuboid is made out of 6 of these cubes.



It has a volume of 6 cm^3 .

5 marks each

Some old-fashioned units of length:
inch, foot, yard, mile, furlong

Before metric units, area was sometimes measured in:

1 square inch $\approx 6.45 \text{ cm}^2$
1 acre $\approx 4,050 \text{ m}^2$

1 litre = $1,000 \text{ cm}^3$
1 m^3 (cubic metre) =
1,000 litres or $1,000,000 \text{ cm}^3$

Round 4

**General
Mathematics
Questions**

Round 4

Question 1

Write the numbers from 81 to 85 in the five boxes so that they satisfy the descriptions.

Each of the numbers should appear **exactly once**.

Three less than a multiple of 11	Prime number	Square number	Two more than a factor of 160	Multiple of 14

The school day starts at 8.45 am.

Before break, there are three 40-minute lessons.

There are two 5-minute 'mini-breaks':
one between Lessons 1 and 2,
the other between Lessons 2 and 3.

At what time does break start?

Round 4

Question 3

Nishi has four cards, each with a fraction on it.

A	B	C	D
$\frac{9}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$

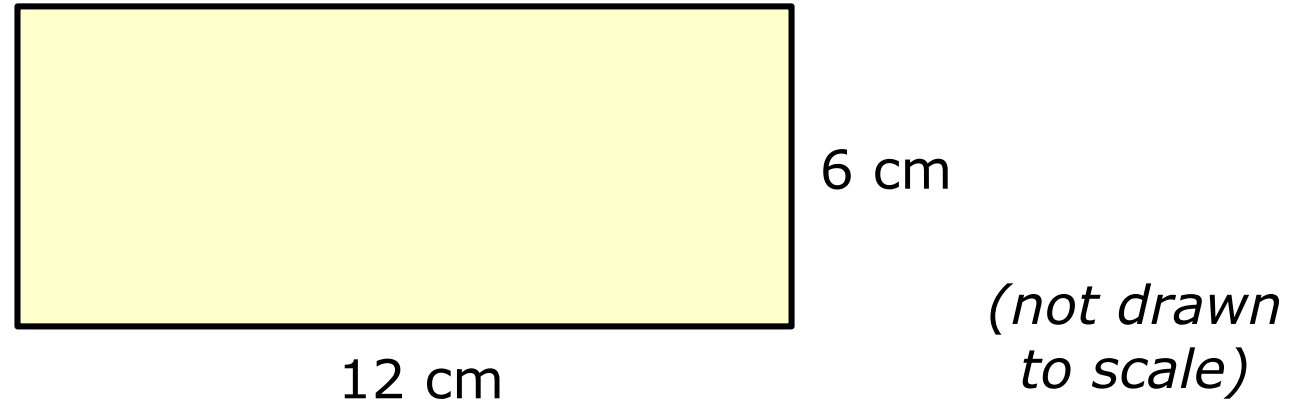
Arrange the four cards in increasing order, starting with the **smallest**.

Write the **letters** of the cards in order, e.g. A B C D.

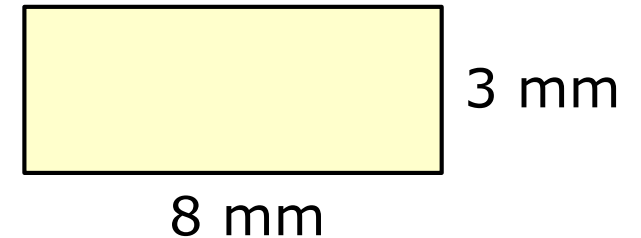
Round 4

Question 4

Here is a rectangle.



The rectangle is cut into smaller rectangles, each one as shown.



All of the larger rectangle is used. None of it is wasted.

How many smaller rectangles can be cut from the larger rectangle?

Round 4

Question 5

Beechway School is changing its school uniform. Every pupil will have to wear a tie.

60 boys and 60 girls were asked what colour the school tie should be.
Here are the results.

	Pink	Blue	Green
Girls	12	6	42
Boys	15	24	21

What percentage of boys preferred blue?

What is the **total** number of lines of symmetry in these shapes?

square

rectangle

parallelogram

kite

equilateral triangle

isosceles triangle

Answers to Round 4

Round 4

Question 1

Write the numbers from 81 to 85 in the five boxes so that they satisfy the descriptions.

Each of the numbers should appear **exactly once**.

Three less than a multiple of 11	Prime number	Square number	Two more than a factor of 160	Multiple of 14
85	83	81	82	84

Round 4

Question 2

The school day starts at 8.45 am.

Before break, there are three 40-minute lessons.

There are two 5-minute 'mini-breaks':
one between Lessons 1 and 2,
the other between Lessons 2 and 3.

At what time does break start? **10:55am**

Round 4

Question 3

Nishi has four cards, each with a fraction on it.

A	B	C	D
$\frac{9}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$

Arrange the four cards in increasing order, starting with the **smallest**.

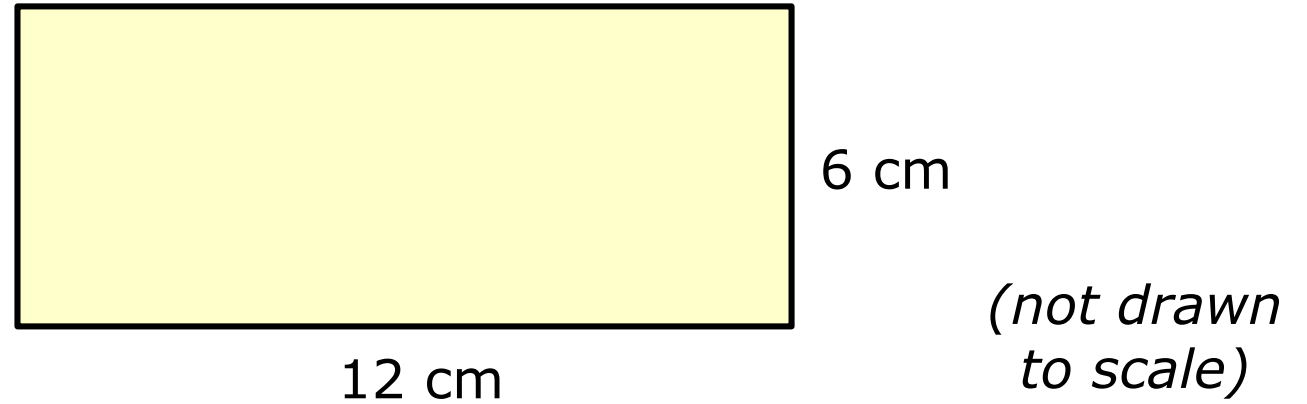
B A D C

* Partial marks awarded for 2 in the correct place

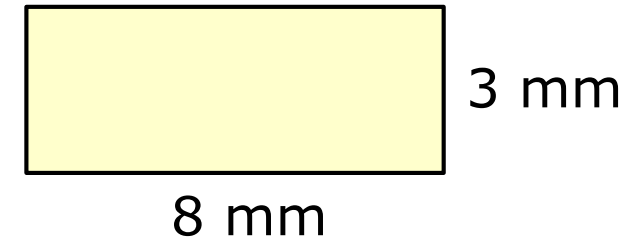
Round 4

Question 4

Here is a rectangle.



The rectangle is cut into smaller rectangles, each one as shown.



All of the larger rectangle is used. None of it is wasted.

How many smaller rectangles can be cut from the larger rectangle?

300

Round 4

Question 5

Beechway School is changing its school uniform. Every pupil will have to wear a tie.

60 boys and 60 girls were asked what colour the school tie should be. Here are the results.

	Pink	Blue	Green
Girls	12	6	42
Boys	15	24	21

What percentage of boys preferred blue?

$$\mathbf{24/60 = 40\%}$$

What is the **total** number of lines of symmetry in these shapes? **11**

square **4**

rectangle **2**

parallelogram **0**

kite **1**

equilateral triangle **3**

isosceles triangle **1**

* Partial marks awarded: 8 marks for 10 or 12; 6 marks for 13 or 9; 4 marks for 14 or 8; 2 marks for 15 or 7