Sparx Maths

Year 8 Term 2

Revision Workbook

About this workbook

This workbook supports the revision of topics covered in **Year 8 Term 2** of the Sparx Maths Curriculum.

The workbook is divided into two sections:

- **Fluency questions** on each unit to practise the key concepts.
- **Mixed questions** on all topics to strengthen and deepen understanding.
  This section contains more challenging reasoning questions, cross-topic questions and problem solving questions.

If you use Sparx Maths you can find more questions and videos by searching for the following Sparx topic codes in Independent Learning.

Topic codes are also given with each question.

Units	Sparx topic codes
Significant figures	M994 M131 M878
Coordinates and midpoints	M622 M311
Area and units	M291 M705 M303 M728
Area and circumference	M595 M169 M231
Standard form and ordinary numbers	M719 M678
Venn diagrams	M829 M419
Factors, multiples and primes	M365
Nets	M767 M518
Surface area	M884 M534 M661
Volume	M765 M722 M465

Calculator questions are marked with this symbol

Non-calculator questions are marked with this symbol

Q1

M994

a) Round 184 to 1 significant figure.

Answer: . . . . . .

b) Round 6482 to 1 significant figure.

Answer: . . . . . .

c) Round 4149 to 2 significant figures.

Answer: . . . . . .

d) Round 23 491 to 3 significant figures.

Answer: . . . . . .

e) Round 2 027 134 to 3 significant figures.

Answer: . . . . . .

Q2

M994

A company made a profit of £927 261

What is this value rounded to 3 significant figures?

Answer: £ . . . . . .

Q3

M131

a) Round 0.281 to 1 significant figure.

Answer: . . .

b) Round 0.126 9 to 2 significant figures.

Answer: . . .

c) Round 8.159 1 to 2 significant figures.

Answer: . . .

d) Round 0.008 73 to 2 significant figures.

Answer: . . .

e) Round 0.030 269 to 3 significant figures

Answer: . . .

Q4

M878

Estimate the answer to

a) 48 x 13

Answer:

b) 816 - 474

Answer:

c) 9.23 + 5.71

Answer:

d) $\frac{732}{49}$

Answer:

Q5

M878

Emma buys 19 textbooks which cost £6.88 each.

Estimate the total amount of money Emma spends.

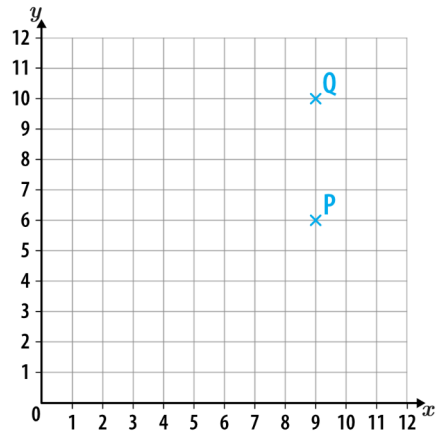
Answer: £

Q1

M622

Point P and point Q are shown on the coordinate grid below.

Calculate the coordinates of the midpoint of point P and point Q.



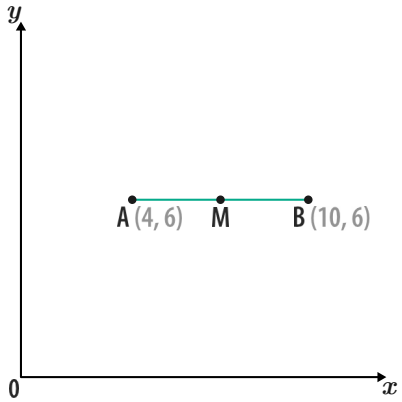
Answer: (. . . . . , ...)

Q2

M622

Point M is the midpoint of line segment AB, shown below.

Work out the coordinates of point M.



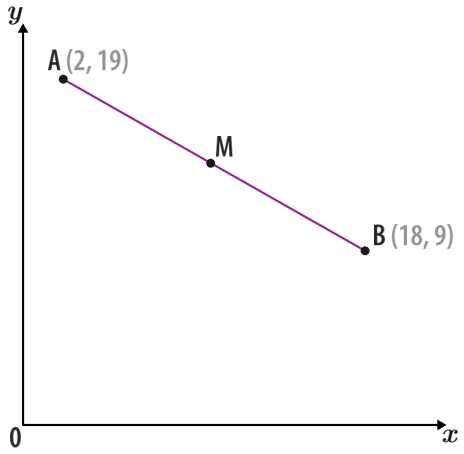
Answer: (. . . . . , ...)

Q3

M622

Point M is the midpoint of line segment AB, shown below.

Work out the coordinates of point M.



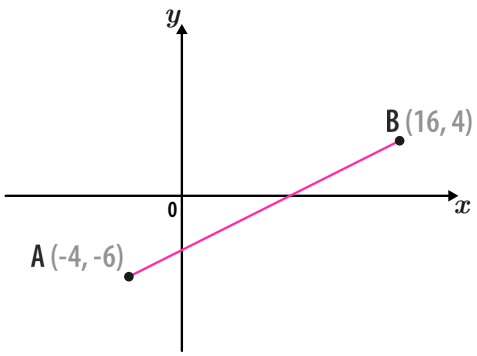
Answer: (. . . . . , ...)

Q4

M622

Line segment AB is shown below.

Work out the coordinates of the midpoint of the line segment.



Answer: (. . . . . , ...)

Q5

M622

Point A has coordinates (-13,-7). Point B has coordinates (1,17).

What are the coordinates of the midpoint of the line segment AB?

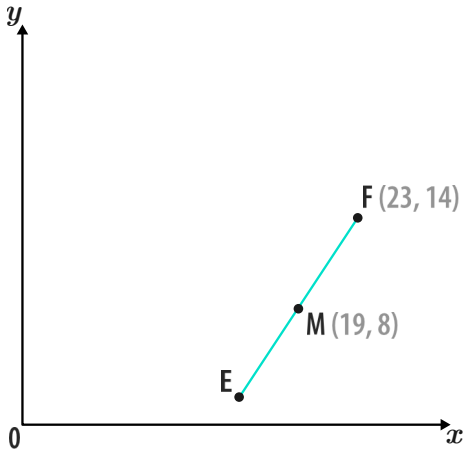
Answer: (. . . . . , ...)

Q6

M622

Point M is the midpoint of line segment EF, shown below.

Work out the coordinates of point E.

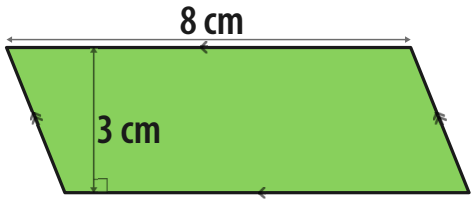


Answer: (. . . . . , ...)

Q1

M291

Work out the **area** of the parallelogram below.



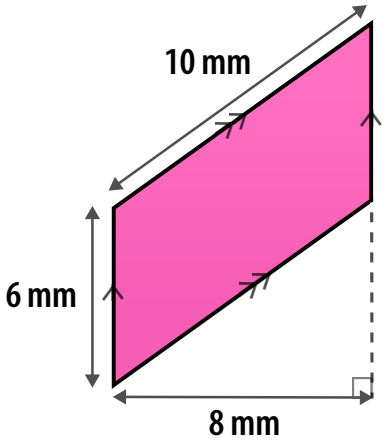
Not drawn accurately

Answer: . . cm^2

Q2

M291

Work out the **area** of the parallelogram below.



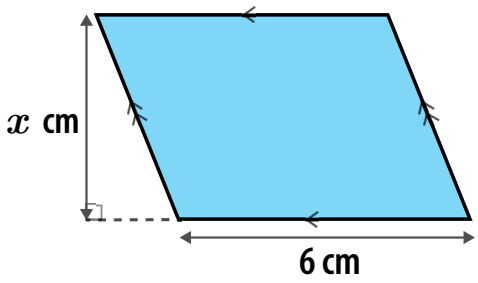
Not drawn accurately

Answer: . . mm^2

Q3

M291

The parallelogram below has an area of 27 cm²
Calculate the height, x.



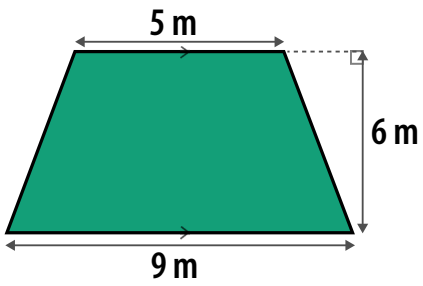
Not drawn accurately

Answer: . . cm

Q4

M705

Work out the **area** of the trapezium below.



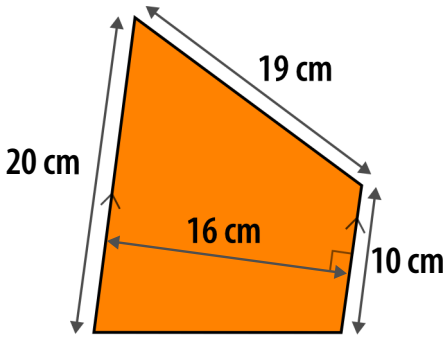
Not drawn accurately

Answer: . . m^2

Q5

M705

Work out the **area** of the trapezium below.



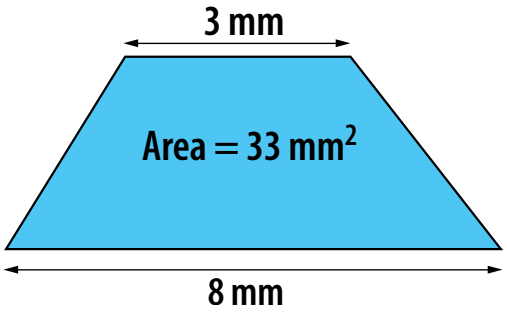
Not drawn accurately

Answer: . . cm^2

Q6

M705

Work out the height of the trapezium below.



Not drawn accurately

Answer: . . mm

Q7
M728

Convert

a) 8.3 mm^2 to cm^2

Answer: . . . . . cm^2

b) 3.9 m^2 to cm^2

Answer: . . . . . cm^2

c) 0.0084 m^2 to mm^2

Answer: . . . . . mm^2

Q8
M728

A field has an area of 29 000 m^2

What is the area of the field in km^2?

Answer: . . . . . km^2

Q9
M728

Which of the following areas is the largest?

590 mm^2 53 cm^2 56 mm^2 54 cm^2

Answer: . .

Q1

M595

Match each definition with its part of a circle.

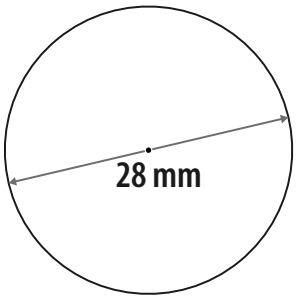
A straight line between two points on the edge of a circle that goes through the centre of the circle	Circumference
The distance around the edge of a circle	Radius
A straight line from the centre of a circle to a point on the edge of the circle	Diameter

Q2

M595

The circle below has a diameter of 28 mm.

Work out the radius of the circle.



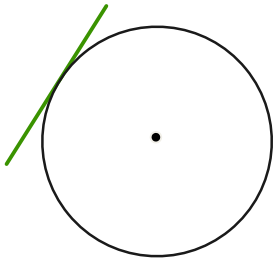
Not drawn accurately

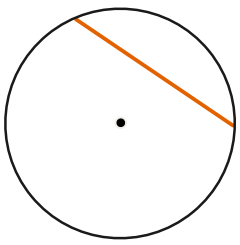
Answer: . . . mm

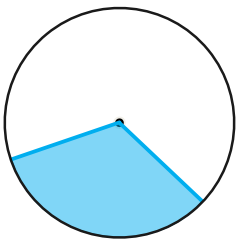
Q3

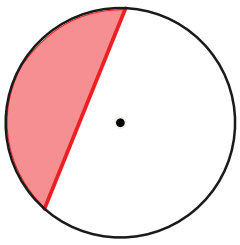
M595

For each of the diagrams, write down whether it shows a **chord**, **segment**, **tangent** or **sector**.









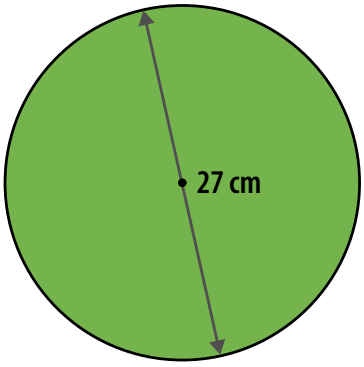
Answer: ....

Q4

M169

Work out the circumference of the circle below.

Give your answer to 1 decimal place.



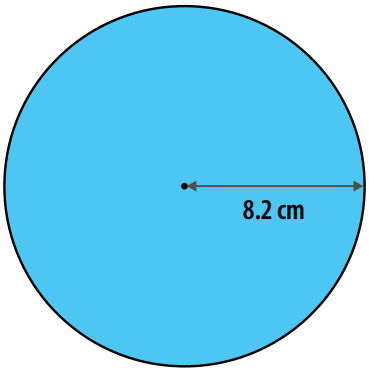
Not drawn accurately

Answer: . . . cm

Q5

M169

The radius of the circle below is 8.2 cm



Not drawn accurately

a) Work out the diameter of the circle. Give your answer to 1 d.p.

Answer: . . cm

b) Work out the circumference of the circle. Give your answer to 1 d.p.

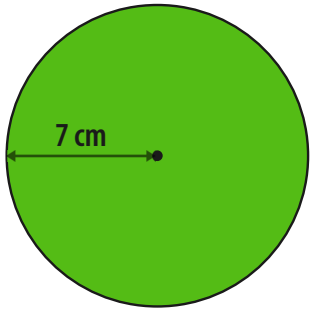
Answer: . . cm

Q6

M231

Calculate the area of the circle below.

Give your answer to 1 decimal place.



Not drawn accurately

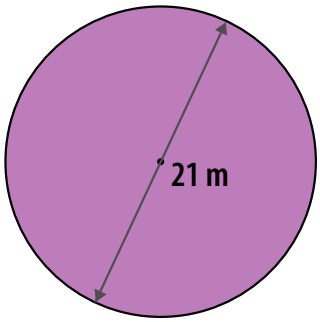
Answer: . . cm^2

Q7

M231

Calculate the area of the circle below.

Give your answer to 1 decimal place.



Not drawn accurately

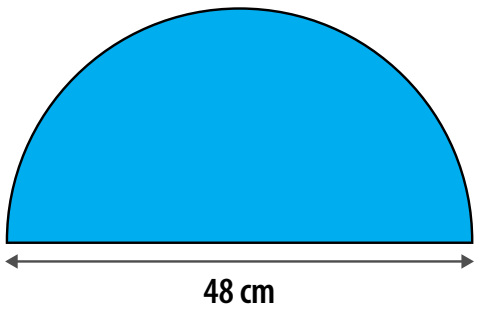
Answer: . . m^2

Q8

M231

Calculate the area of the semicircle below.

Give your answer to 1 decimal place.



Not drawn accurately

Answer: . . cm^2

Q1
M719

a) Write 8×10^4 as an ordinary number.

Answer: . . .

b) Write 3.9×10^5 as an ordinary number.

Answer: . . .

c) Write 7.041×10^5 as an ordinary number.

Answer: . . .

Q2
M719

a) Write 68 000 in standard form.

Answer: . . .

b) Write 6050 in standard form.

Answer: . . .

Q3
M719

Circle **all** of the values below that are written correctly in standard form.

7.7×10^6	16×10^3	0.8×10^2
2.5 million	2.5×10^4	140,000,000

Q4

M678

a) Write 2.6×10^{-2} as an ordinary number.

Answer: . . . . . .

b) Write 4.017×10^{-5} as an ordinary number.

Answer: . . . . . .

Q5

M678

a) Write 0.0009 in standard form.

Answer: . . .

b) Write 0.062 in standard form.

Answer: . . .

c) Write 0.00807 in standard form.

Answer: . . .

Q6

M678

A scientist calculates that the thickness of a piece of paper is 1.09×10^{-4} m.

Write this thickness as an ordinary number.

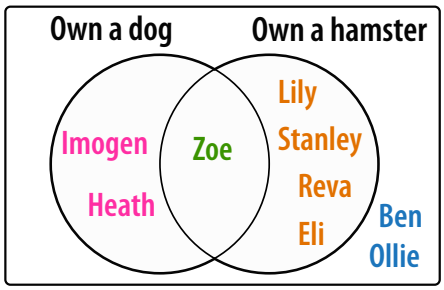
Answer: . . . . . m

Q1

M829

M419

A group of students were asked what pets they own. The results are shown in the Venn diagram.



a) How many students own a dog?

Answer:

b) How many students own a dog **and** a hamster?

Answer:

c) Work out the probability that a student chosen at random owns a hamster.

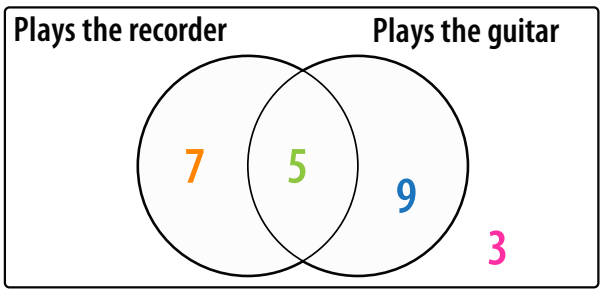
Answer:

Q2

M829

M419

A group of students were asked what musical instrument they play. The results are shown in the Venn diagram.



How many students

a) play the guitar?

Answer:

Work out the probability that a student chosen at random

b) plays the recorder but **not** the guitar?

Answer:

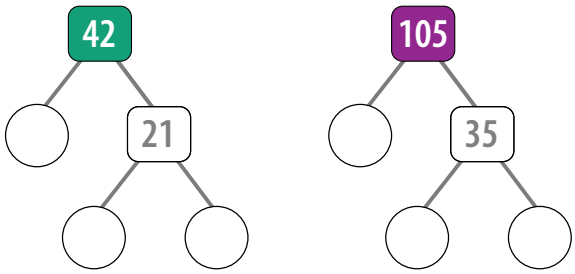
c) does **not** play the guitar.

Answer:

Q1

M365

Complete the prime factor trees for 42 and 105.



What is the highest common factor (HCF) of 42 and 105?

Answer: . .

Q2

M365

a) By first drawing prime factor trees, express 70 and 130 as the product of their prime factors.

Answer: 70 = ... 130 = ...

b) What is the highest common factor (HCF) of 70 and 130?

Answer: . .

c) What is the lowest common multiple (LCM) of 70 and 130?

Answer: . .

Q3

M365

a) Express 90 and 135 as the product of their prime factors.

Answer: 90 = ... 135 = ...

b) What is the highest common factor (HCF) of 90 and 135?

Answer: . . .

c) What is the lowest common multiple (LCM) of 90 and 135?

Answer: . . .

Q4

M365

The prime factor decompositions of 1400 and 6468 are shown below.

$1400 = 2^3 \times 5^2 \times 7$

$6468 = 2^2 \times 3 \times 7^2 \times 11$

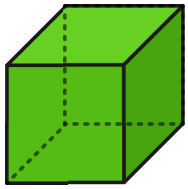
What is the highest common factor (HCF) of 1400 and 6468?

Answer: . .

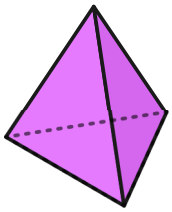
Q1

M767

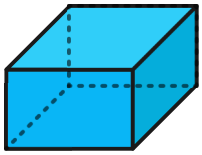
What is the mathematical name for each 3D shape?



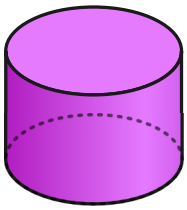
Answer: .....



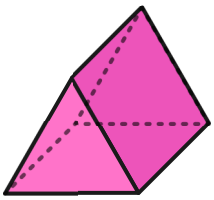
Answer: .....



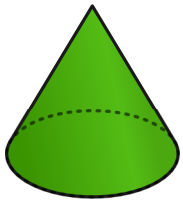
Answer: .....



Answer: .....



Answer: .....

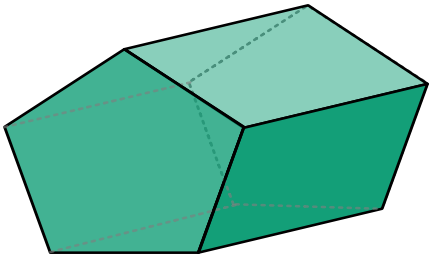


Answer: .....

Q2

M767

Here is a 3D shape.



a) What is the mathematical name for this 3D shape?

Answer: .....

b) How many faces does the shape have?

Answer: .....

c) How many edges does the shape have?

Answer: .....

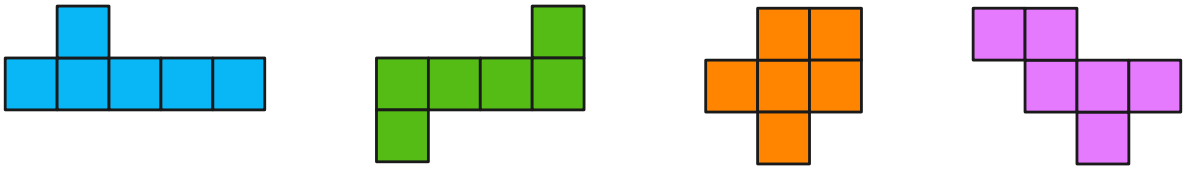
d) How many vertices does the shape have?

Answer: .....

Q3

M767

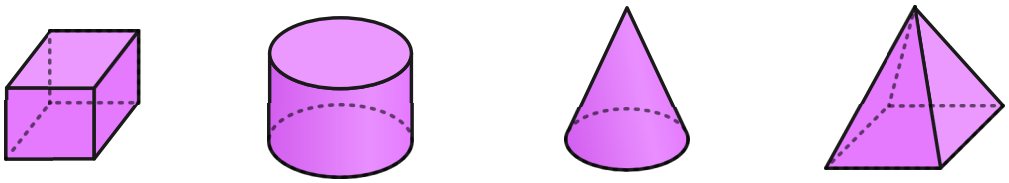
Circle the **two** correct nets of a cube.

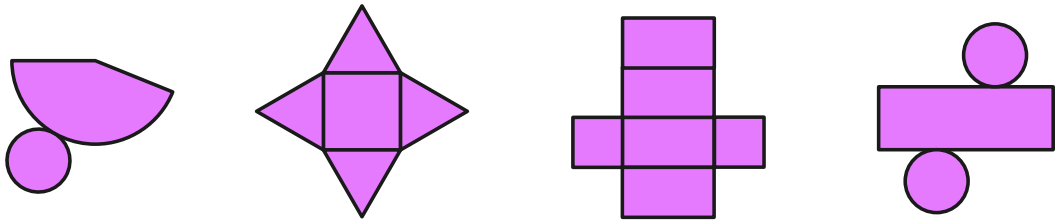


Q4

M518

Match each 3D shape to its net.

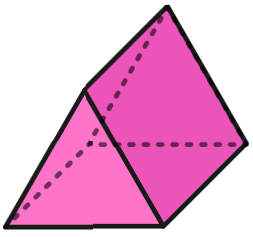




Q5

M518

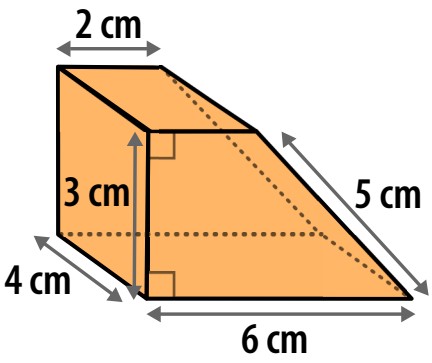
Sketch a net of the 3D shape below.



Q6

M518

Draw an accurate net of the prism below.



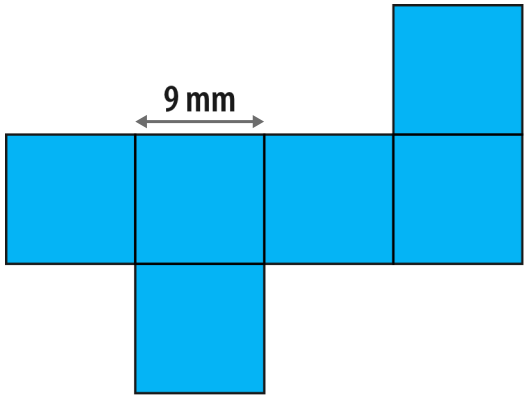
1 cm

Q1

M884

The net of a cube is shown below.

Work out the surface area of the cube.



Not drawn accurately

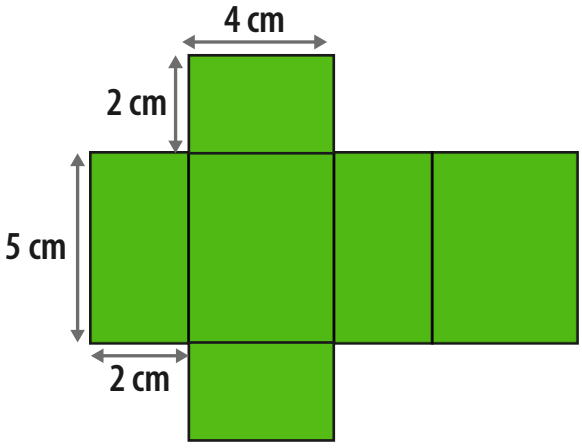
Answer: . . . mm^2

Q2

M884

The net of a cuboid is shown below.

Work out the surface area of the cuboid.



Not drawn accurately

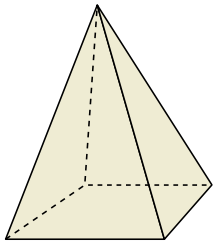
Answer: . . . cm^2

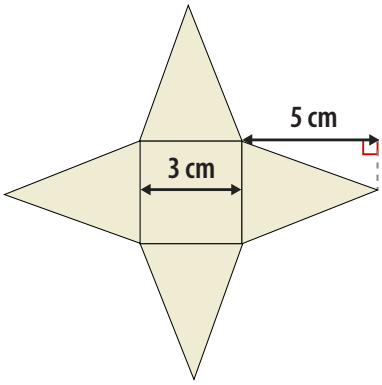
Q3

M884

A square based pyramid and its net are shown below. All of its triangular faces are identical.

Work out the surface area of the pyramid.





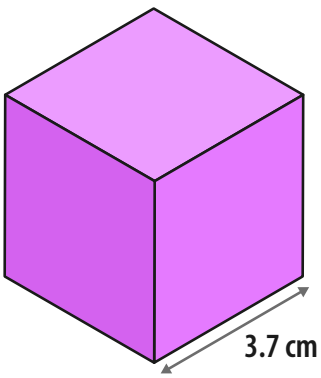
Not drawn accurately

Answer: . . . cm^2

Q4

M534

Work out the surface area of the cube below.



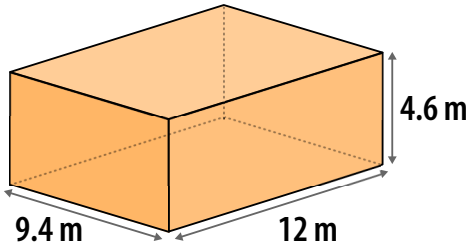
Not drawn accurately

Answer: . . . cm^2

Q5

M534

Work out the surface area of the cuboid below.



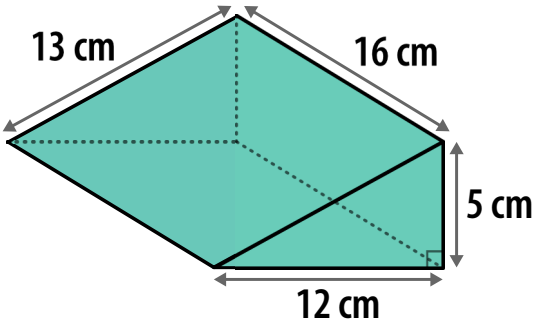
Not drawn accurately

Answer: . . . m^2

Q6

M661

Work out the surface area of the triangular prism below.



Not drawn accurately

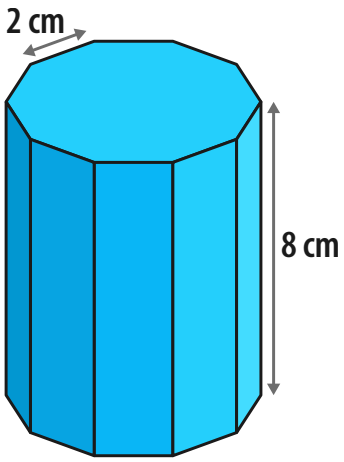
Answer: . . . cm^2

Q7

M661

The prism below has a cross-sectional area of 31 cm^2

Calculate the total surface area of the prism.



Not drawn accurately

Answer: . . . cm^2

Q8

M661

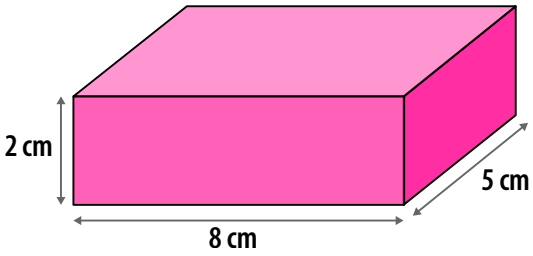
A cuboid has a length of 9 cm, a width of 20 cm and a height of 16 cm.

What is the surface area of the cuboid?

Answer: . . . cm^2

Q1
M765

Calculate the **volume** of the cuboid below.

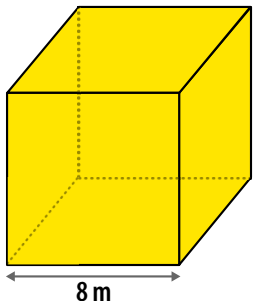


Not drawn accurately

Answer: . . . cm^3

Q2
M765

Calculate the **volume** of the cube below.



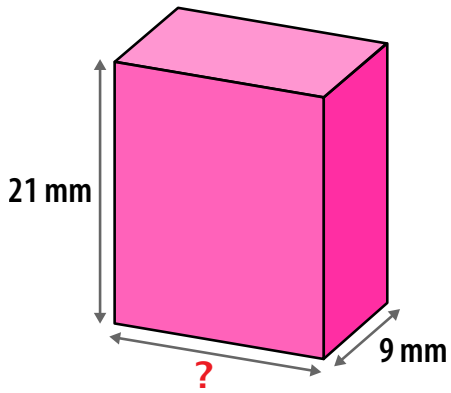
Not drawn accurately

Answer: . . . m^3

Q3
M765

The cuboid below has a height of 21 mm and a width of 9 mm.
It has a volume of 2457 mm.

Work out the unknown **length** of the cuboid.



Not drawn accurately

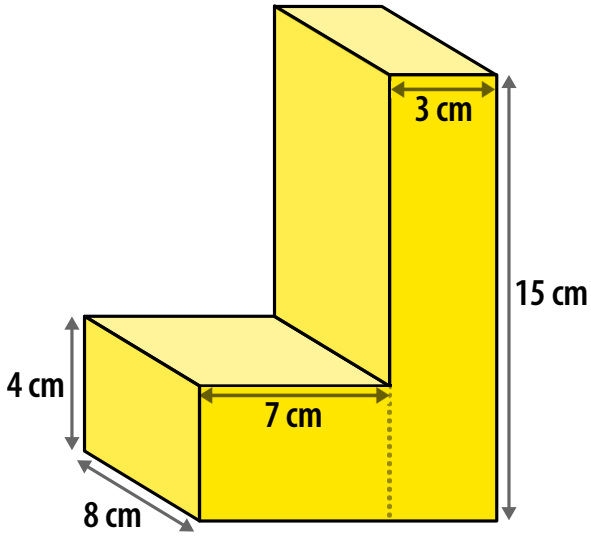
Answer: . . . mm

Q4

M722

The cross-section of the prism below is a compound shape formed from two rectangles.

Work out the volume of the prism.



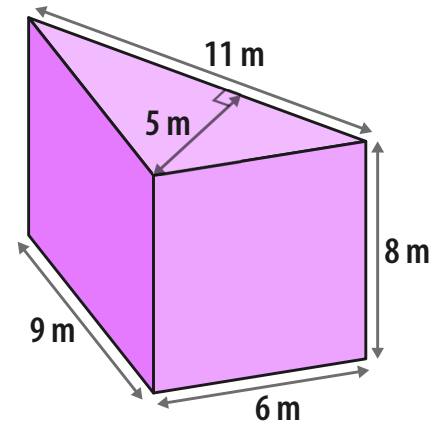
Not drawn accurately

Answer: . . . cm^3

Q5

M722

Work out the volume of the triangular prism below.



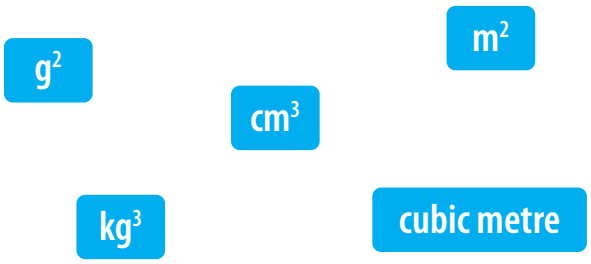
Not drawn accurately

Answer: . . . m^3

Q6

M465

Circle all of the units of volume below.



Q7

M465

Convert

a) 4.1 cm^3 to mm^3

Answer: . . . . . mm^3

b) 83 000 cm^3 to m^3

Answer: . . . . . m^3

c) 43 mm^3 to cm^3

Answer: . . . . . cm^3

d) 59 000 m^3 to km^3

Answer: . . . . . km^3

e) 0.0033 m^3 to cm^3

Answer: . . . . . cm^3

f) 0.0382 km^3 to m^3

Answer: . . . . . m^3

Q1

M719

Reuben estimates that he takes 3.46×10^6 steps a year.

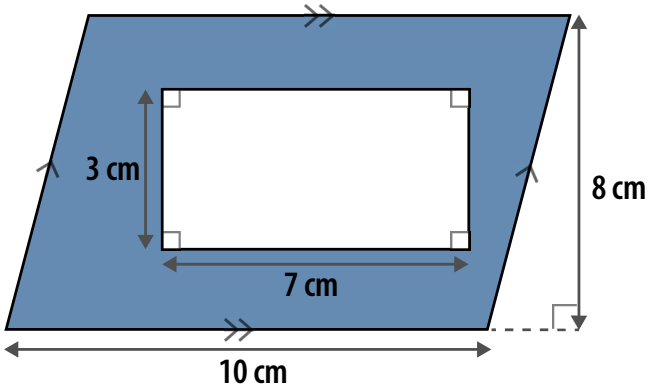
Write this value as an ordinary number.

Answer: . . . . . .

Q2

M303

Work out the area of the shaded shape below.



Not drawn accurately

Answer: . . . . . cm^2

Q3

M878

Estimate the value of 4.317×61.173

Answer: . . . . . .

Q4
M728

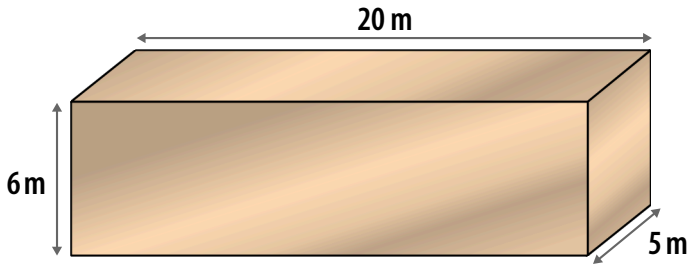
Convert 3 520 000 mm^2 to m^2

Answer: . . m^2

Q5
M765

A block of metal has a volume of 9600 m^3. The block of metal is melted down to form identical cuboids, an example of which is shown below.

How many **complete** cuboids like the one below can be formed from the block of metal?



Answer: . .

Q6
M678
M131

Write 0.000 020 687 in standard index form to 3 significant figures.

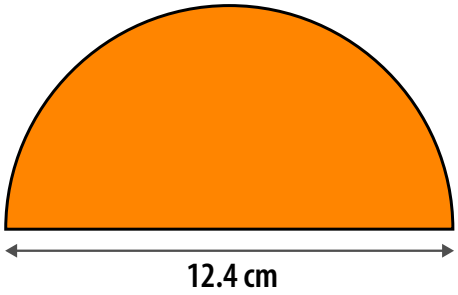
Answer: . . . . . .

Q7

M169

Work out the **perimeter** of the semicircle below.

Give your answer to 3 significant figures.



Not drawn accurately

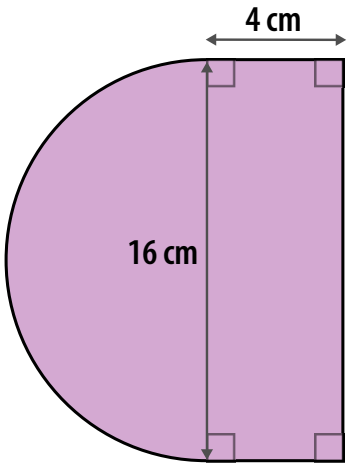
Answer: . . . . . cm

Q8

M231

The compound shape below is formed from a semicircle and a rectangle.

Calculate the area of the compound shape. Give your answer to 3 significant figures.



Not drawn accurately

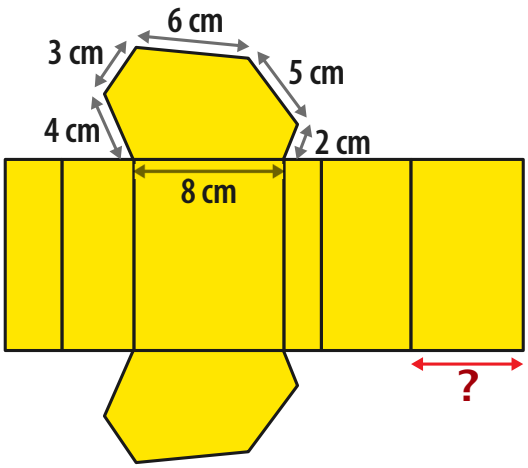
Answer: . . . . . cm^2

Q9

M518

A net of a hexagonal prism is shown below.

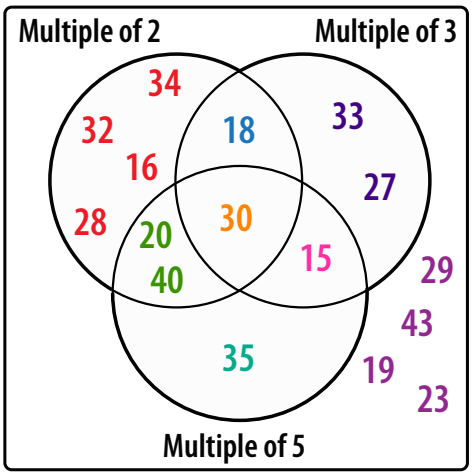
Work out the marked unknown length.



Answer: . . . . . cm

Q10

M419



Calculate the probability that a number picked at random from the 16 numbers in the Venn diagram is

a) both a multiple of 2 **and** a multiple of 5

Answer: . . . . . .

b) **not** a multiple of 3

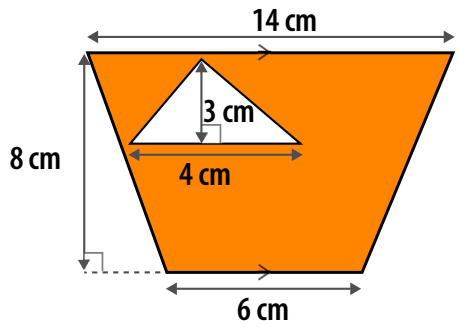
Answer: . . . . . .

Give your answers as fractions in their simplest form.

Q11

M303

Calculate the shaded area below.



Not drawn accurately

Answer: . . . . . cm^2

Q12

M719

The average distance between Earth and Jupiter is about six hundred and twenty eight million kilometres.

What is this distance in standard form?

Answer: . . . . . km

Q13

M365

The prime factor decompositions of two numbers are shown:

$$6435 = 3^2 \times 5 \times 11 \times 13$$

$$8190 = 2 \times 3^2 \times 5 \times 7 \times 13$$

Circle the prime factor decompositions below which are common factors of 6435 and 8190

$2 \times 3 \times 5 \times 7 \times 11 \times 13$

2×3

3×13

$3^2 \times 5 \times 13$

3^2

$3 \times 5 \times 11$

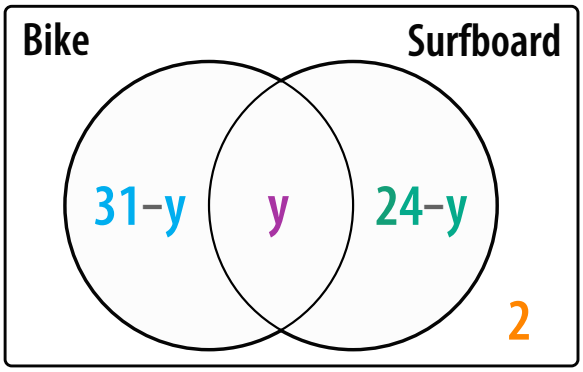
$2 \times 7 \times 11$

$2 \times 3^4 \times 5^2 \times 7 \times 11 \times 13^2$

Q14

M829

There are 49 members in a sports club. Use the Venn diagram to work out how many people in the club own both a bike and a surfboard.

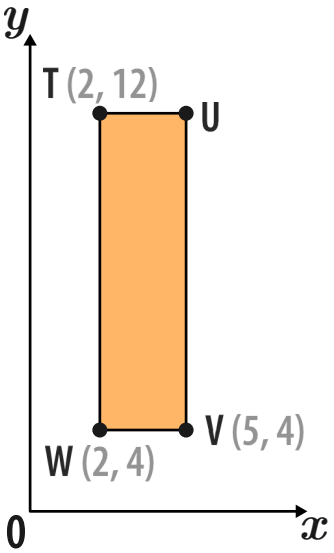


Answer: . . .

Q15

M311

Rectangle TUVW has been drawn on the axes below.



Not drawn accurately

a) Calculate the area of the rectangle.

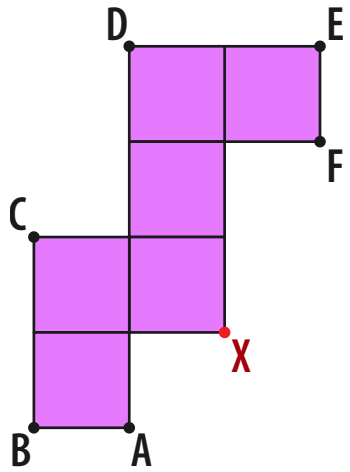
Answer: . . . . . units^2

b) What are the coordinates of point U?

Answer: (. . . . . , ...)

Q16
M518

When this net is folded into a cube, which **two** points does point X meet?



Answer: . . . . . .

Q17
M465

Write the following volumes in ascending order.

$0.0024\ cm^3$ $19\ cm^3$ $1.3\ mm^3$ $15\ 000\ mm^3$

Answer:

. . . . . .

Q18
M534
M878

A cube has a side length of 5.24 cm

Estimate the surface area of the cube.

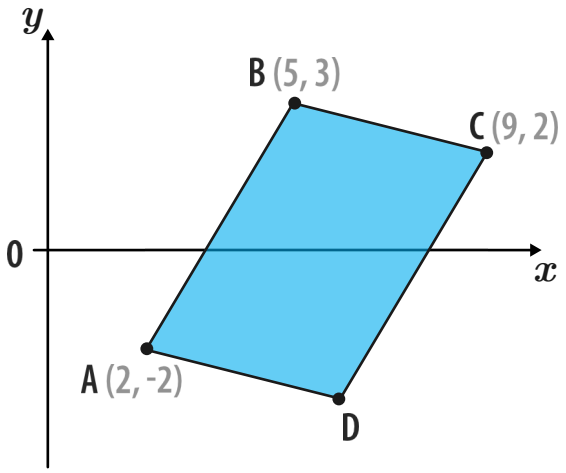
Answer: . . . . . cm^2

Q19

M311

Shape ABCD below is a parallelogram.

What are the coordinates of point D?



Not drawn accurately

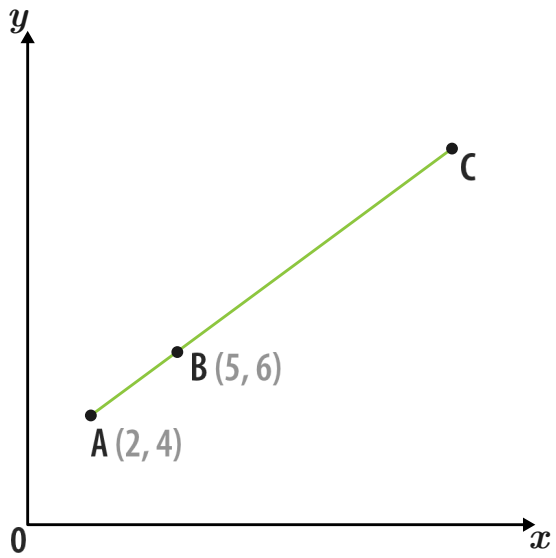
Answer: (. . . . . , ...)

Q20

M311

A, B and C are points on a straight line.
The ratio of AB to BC is 1 : 4

What are the coordinates of point C?



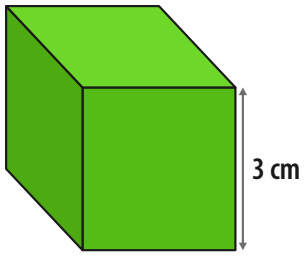
Not drawn accurately

Answer: (. . . . . , ...)

Q21
M534

A painter has some paint that will cover an area of 400 cm^2

How many of these cubes can they completely cover with paint?



Not drawn accurately

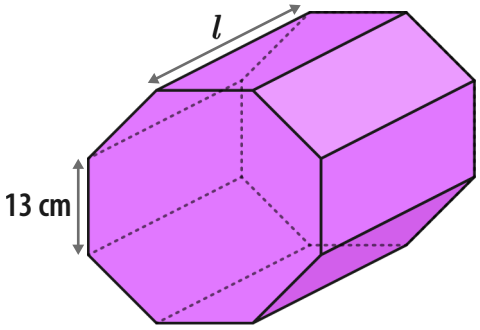
Answer: . . . . . .

Q22
M661

The cross-section of the prism below is a regular octagon with an area of 816 cm^2

The total surface area of the prism is 4232 cm^2

Calculate the length, l, of the prism.



Not drawn accurately

Answer: . . . . . cm

Q23
M169
M231
M131

The circumference of a circle is 156 mm.

Calculate the area of the circle. Give your answer to 3 significant figures.

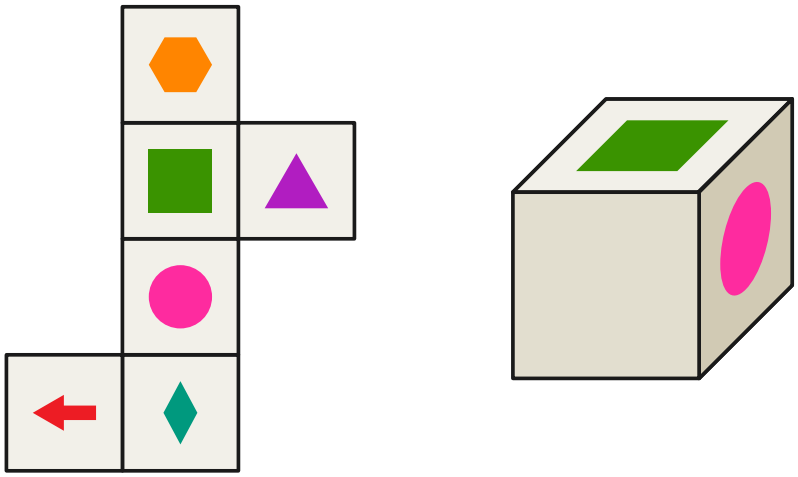
Answer: . . . . . mm^2

Q24

M518

Symbols are drawn on one side of a net as shown. The net is folded into a cube so that the symbols are on the outside.

Draw the symbol that should be on the front of the cube in the correct orientation.



Q25

M365

Samuel has 2 rolls of ribbon. He has 99m of yellow ribbon and 165 m of purple ribbon.

He wants to cut all of the ribbon into smaller pieces of equal length, with no ribbon left over.

Work out the greatest possible length that Samuel could make the smaller pieces of ribbon.

Answer: . . . . . m

Q26

M534

M765

A cube has a volume of 343 mm^3

a) Calculate the side length of the cube.

Answer: . . . . . mm

b) Calculate the surface area of the cube.

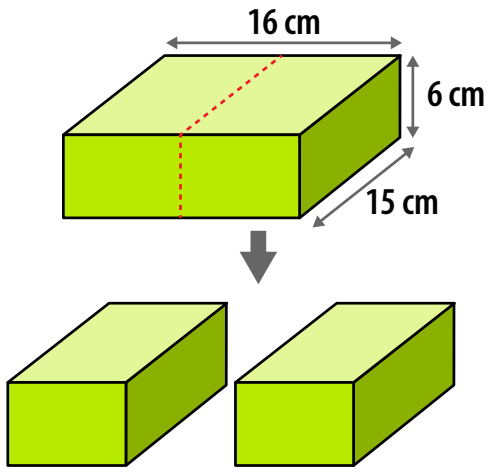
Answer: . . . . . mm^2

Q27

M534

The cuboid below is cut exactly in half along the dotted line to form two new cuboids, as shown.

Calculate the **total surface area** of the two **new** cuboids.



Not drawn accurately

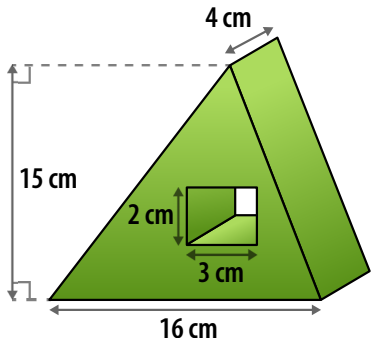
Answer: . . . . . cm^2

Q28

M722

A shape is made from a triangular prism with a rectangular hole through the middle, as shown.

Calculate the volume of the shape.



Not drawn accurately

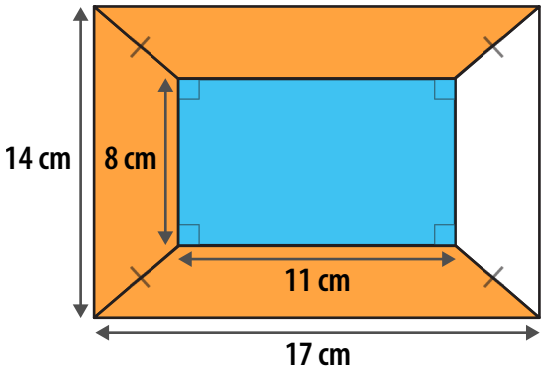
Answer: . . . . . cm^3

Q29

M303

The shape below is made from four trapeziums and one rectangle.

Work out the area of the **unshaded** trapezium.



Not drawn accurately

Answer: . . . . . cm^2

Q30

M365

As part of an Olympic training programme, an athlete is required to have a blood test every 70 days and a fitness test every 75 days.

On the day before the programme started an athlete had a blood test and a fitness test.

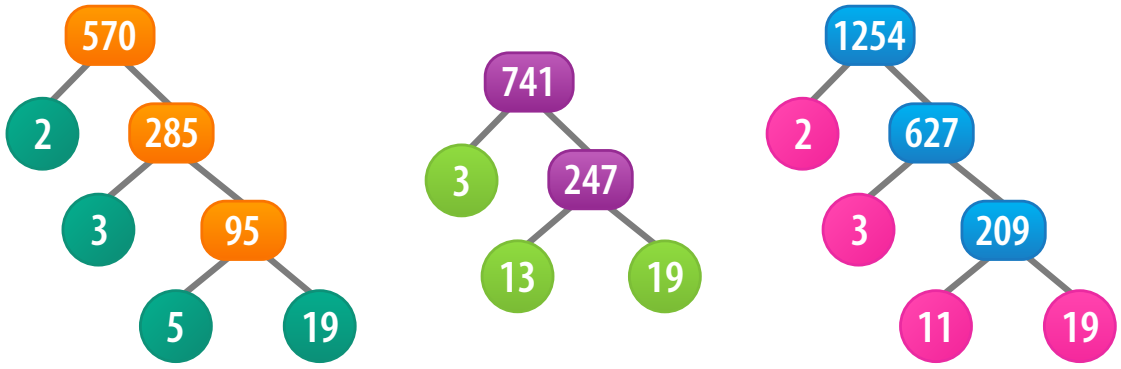
After how many days will they next have a blood test and a fitness test on the same day?

Answer: . . . . . .

Q31

M365

Use the prime factor trees below to find the **highest common factor (HCF)** of 570, 741 and 1254.



Answer: . . . . . .

Answers

Significant figures

Q1a 200
Q1b 6000
Q1c 4100
Q1d 23 500
Q1e 2 030 000
Q2 £927 000
Q3a 0.3
Q3b 0.13
Q3c 8.2
Q3d 0.008 7
Q3e 0.030 3

Q4a 500
Q4b 300
Q4c 15
Q4d 14
Q5 £140

Coordinates and midpoints

Q1 (9,8)
Q2 (7,6)
Q3 (10,14)

Q4 (6,-1)
Q5 (-6,5)
Q6 (15,2)

Area and units

Q1 24 cm^2
Q2 48 cm^2
Q3 4.5 cm

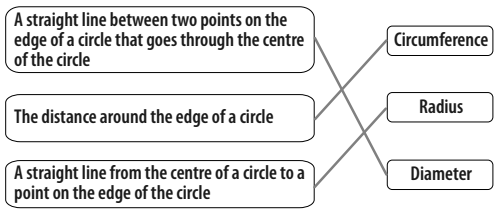
Q4 42 m^2
Q5 240 cm^2
Q6 6 mm

Area and units

Q7a 0.083 cm^2
Q7b 39 000 cm^2
Q7c 8400 mm^2
Q8 0.029 km^2
Q9 54 cm^2

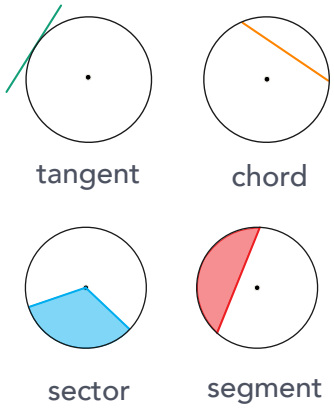
Area and circumference

Q1



Q2 14 mm

Q3



Q4 84.8 cm
Q5a 16.4 cm
Q5b 51.5 cm

Q6 153.9 cm^2 or 154.0 cm^2
Q7 346.4 cm^2 or 346.2 cm^2
Q8 904.8 cm^2 or 904.3 cm^2 or 904.9 cm^2

Standard form and ordinary numbers

Q1a 80 000
Q1b 390 000
Q1c 704 100

Standard form and ordinary numbers cont.

Q2a 6.8×10^4

Q2b 6.05×10^3

Q3 7.7×10^6 and 2.5×10^4 circled

Q4a 0.026

Q4b 0.000 040 17

Q5a 9×10^{-4}

Q5b 6.2×10^{-2}

Q5c 8.07×10^{-3}

Q6 0.000 109 m

Venn diagrams

Q1a 3

Q1b 1

Q1c $\frac{5}{9}$

Q2a 14

Q2b $\frac{7}{24}$

Q2c $\frac{5}{12}$ or $\frac{10}{24}$

Factors, multiples and primes

Q1 21

Q2a 70=2x5x7 130=2x5x13

Q2b 10

Q2c 910

Q3a $90=2x3^2x5$ $135=3^3x5$

Q3b 45

Q3c 270

Q4 28

Nets

Q1

cube

(triangular based) pyramid

cuboid

cylinders

(triangular) prism

cone

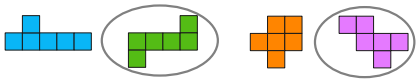
Q2a (pentagonal) prism

Q2b 7

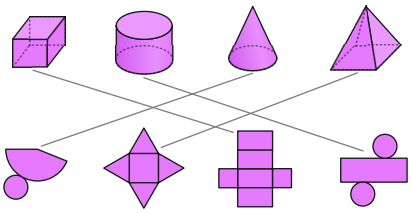
Q2c 15

Q2d 10

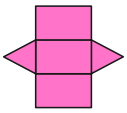
Q3



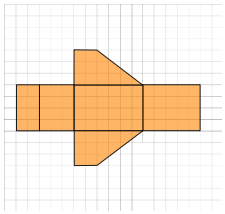
Q4



Q5 Any correct net e.g.



Q6 Any correct net e.g.



Surface area

Q1 486 mm²

Q2 76 cm²

Q3 39 cm²

Q4 82.14 cm²

Surface area cont.

Q5 422.48 m^2

Q6 540 cm^2

Q7 222 cm^2

Q8 1288 cm^2

Volume

Q1 80 cm^3

Q2 512 m^3

Q3 13 mm

Q4 584 cm^3

Q5 220 m^3

Q6 cm^3 and cubic metre circled.

Q7a 4100 mm^3

Q7b 0.083 m^3

Q7c 0.043 cm^3

Q7d 0.000 059 km^3

Q7e 3300 cm^3

Q7f 38 200 000 m^3

Mixed questions

Q1 3 460 000

Q2 59 cm^2

Q3 240

Q4 3.52 m^2

Q5 16

Q6 2.07×10^{-5}

Q7 31.9 cm

Q8 164 cm^2 or 165 cm^2

Q9 6 cm

Q10a $\frac{3}{16}$

Q10b $\frac{11}{16}$

Q11 74 cm^2

Q12 6.28×10^8

Q13 $3^2 \times 5 \times 13$, 3^2, 3×13

Q14 8

Q15a 24 $units^2$

Q15b (5,12)

Q16 A and E

Q17 1.3 mm^3, 0.002 4 cm^3, 15 000 mm^3, 19 cm^3

Q18 150 cm^3

Q19 (6,-3)

Q20 (17,14)

Q21 7

Q22 $l = 25$

Q23 1940 mm^3

Q24 

Q25 33 m

Q26a 7 mm

Q26b 294 mm^2

Q27 1032 cm^2

Q28 456 cm^3

Q29 33 cm^2

Q30 1050 days

Q31 57

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