AREA AND VOLUME

Pearson Edexcel - Wednesday 8 November 2017 - Paper 3 (Calculator) Higher Tier

1.

3 A gold bar has a mass of 12.5 kg.

The density of gold is 19.3 g/cm^3

Work out the volume of the gold bar.
Give your answer correct to 3 significant figures.

..... cm^3

(Total for Question 3 is 3 marks)

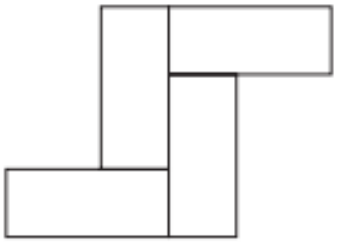
Pearson Edexcel - Wednesday 8 November 2017 - Paper 3 (Calculator) Higher Tier

2.

6 Here is a rectangle.

The length of the rectangle is **7** cm longer than the width of the rectangle.

4 of these rectangles are used to make this 8-sided shape.



The perimeter of the 8-sided shape is **70** cm.

Work out the area of the 8-sided shape.

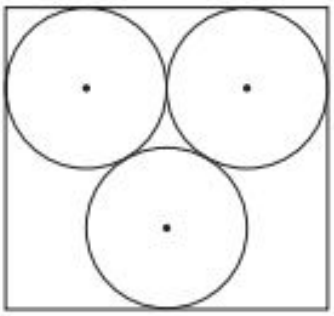
..... cm^2

(Total for Question 6 is 5 marks)

Pearson Edexcel - Thursday 8 June 2017 - Paper 2 (Calculator) Higher Tier

3.

21 The diagram shows 3 identical circles inside a rectangle.
Each circle touches the other two circles and the sides of the rectangle, as shown in the diagram.



The radius of each circle is 24 mm.

Work out the area of the rectangle.
Give your answer correct to 3 significant figures.

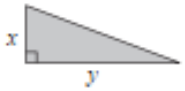
..... mm²

(Total for Question 21 is 4 marks)

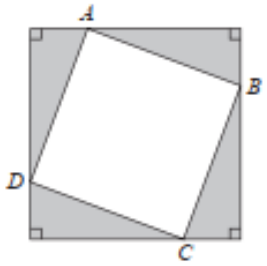
Pearson Edexcel - Specimen Papers Set 2 - Paper 3 (Calculator) Higher Tier

4.

7 Here is a right-angled triangle.



Four of these triangles are joined to enclose the square $ABCD$ as shown below.



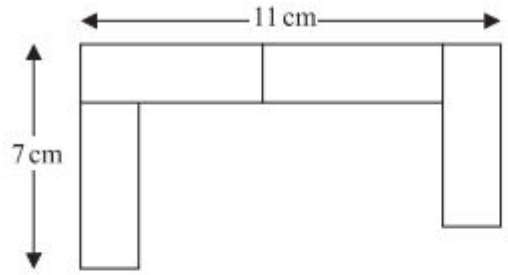
Show that the area of the square $ABCD$ is $x^2 + y^2$

(Total for Question 7 is 3 marks)

Pearson Edexcel - Specimen Papers Set 1 - Paper 1 (Non-Calculator) Higher Tier

5.

4 A pattern is made using identical rectangular tiles.



Find the total area of the pattern.

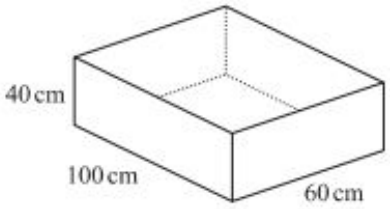
..... cm^2

(Total for Question 4 is 4 marks)

Pearson Edexcel - Specimen Papers Set 1 - Paper 1 (Non-Calculator) Higher Tier

6.

5 The diagram shows a sand pit.
The sand pit is in the shape of a cuboid.



Sally wants to fill the sand pit with sand.
A bag of sand costs £2.50
There are 8 litres of sand in each bag.

Sally says,

"The sand will cost less than £70"

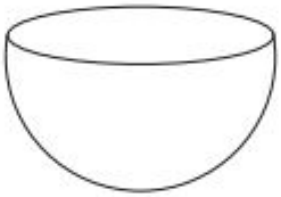
Show that Sally is wrong.

(Total for Question 5 is 5 marks)

Pearson Edexcel - Specimen Papers Set 1 - Paper 1 (Non-Calculator) Higher Tier

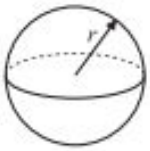
7.

18 The diagram shows a solid hemisphere.



Volume of sphere $= \frac{4}{3}\pi r^3$

Surface area of sphere $= 4\pi r^2$



The volume of the hemisphere is $\frac{250}{3}\pi$

Work out the exact total surface area of the solid hemisphere.
Give your answer as a multiple of π.

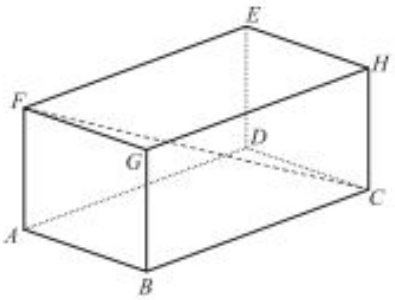
..... cm^2

(Total for Question 18 is 4 marks)

Pearson Edexcel - Specimen Papers Set 1 - Paper 3 (Calculator) Higher Tier

8.

12 The diagram shows a cuboid *ABCDEFGH*.



$AB = 7$ cm, $AF = 5$ cm and $FC = 15$ cm.

Calculate the volume of the cuboid.
Give your answer correct to 3 significant figures.

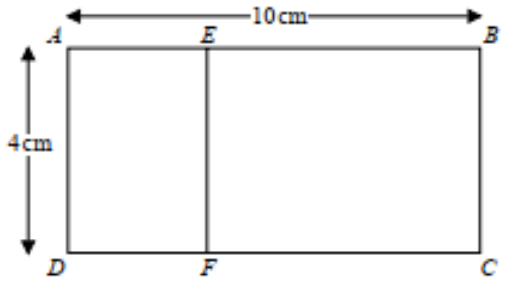
..... cm^3

(Total for Question 12 is 4 marks)

Pearson Edexcel - Sample Paper 1 - (Non-Calculator) Higher Tier

9.

13 Rectangle $ABCD$ is mathematically similar to rectangle $DAEF$.



$AB = 10$ cm.
$AD = 4$ cm.

Work out the area of rectangle $DAEF$.

..... cm^2

(Total for Question 13 is 3 marks)

Pearson Edexcel - Sample Paper 1 - (Non-Calculator) Higher Tier

10.

18 Solid **A** and solid **B** are mathematically similar.
The ratio of the surface area of solid **A** to the surface area of solid **B** is 4 : 9

The volume of solid **B** is 405 cm³.

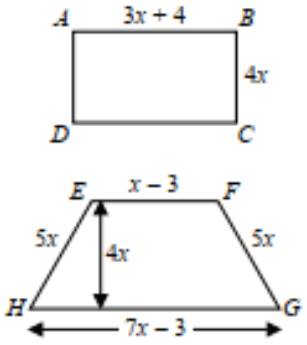
Show that the volume of solid **A** is 120 cm³.

(Total for Question 18 is 3 marks)

Pearson Edexcel - Sample Paper 2 - (Calculator) Higher Tier

11.

9 *ABCD* is a rectangle.
EFGH is a trapezium.



All measurements are in centimetres.
The perimeters of these two shapes are the same.

Work out the area of the rectangle.

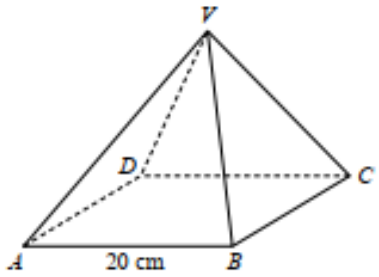
..... cm²

(Total for Question 9 is 5 marks)

Pearson Edexcel - Sample Paper 3 - (Calculator) Higher Tier

12.

16 *VABCD* is a solid pyramid.



ABCD is a square of side 20 cm.

The angle between any sloping edge and the plane *ABCD* is 55°

Calculate the surface area of the pyramid.
Give your answer correct to 2 significant figures.

.....cm²

(Total for Question 16 is 5 marks)

Pearson Edexcel - Thursday 4 June 2015 - Paper 1 (Non-Calculator) Higher Tier

13.

*10 The diagram shows the floor plan of Mary's conservatory.

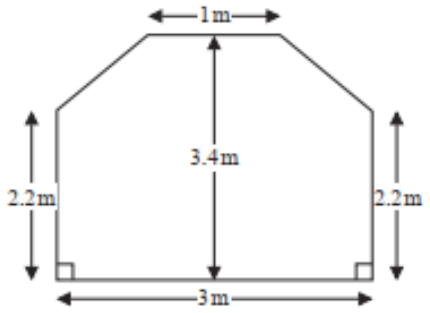


Diagram **NOT** accurately drawn

Mary is going to cover the floor with tiles.

The tiles are sold in packs.
One pack of tiles will cover 2 m²
A pack of tiles normally costs £24.80
Mary gets a discount of 25% off the cost of the tiles.

Mary has £100

Does Mary have enough money to buy all the tiles she needs?
You must show all your working.

(Total for Question 10 is 5 marks)

Pearson Edexcel - Monday 8 June 2015 - Paper 2 (Calculator) Higher Tier

14.

23 Here is a parallelogram.

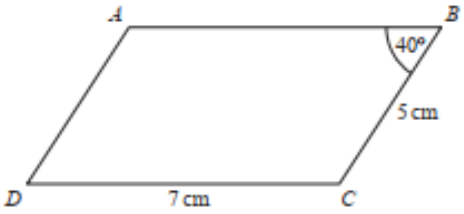


Diagram **NOT** accurately drawn

$DC = 7$ cm
$CB = 5$ cm
Angle ABC is 40°

Work out the area of the parallelogram.
Give your answer correct to 1 decimal place.

..... cm²

(Total for Question 23 is 3 marks)

Pearson Edexcel - Wednesday 5 November 2014 - Paper 1 (Non-Calculator) Higher Tier

15.

7 The diagram shows the plan of a floor.

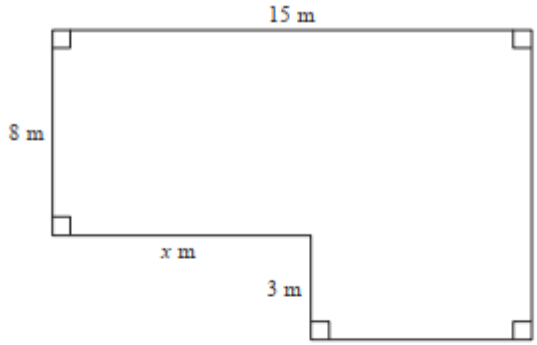


Diagram **NOT** accurately drawn

The area of the floor is 138 m^2.

Work out the value of x.

.....

(Total for Question 7 is 4 marks)

Pearson Edexcel - Friday 13 June 2014 - Paper 2 (Calculator) Higher Tier

16.

25 The diagram shows a solid made from a hemisphere and a cone.

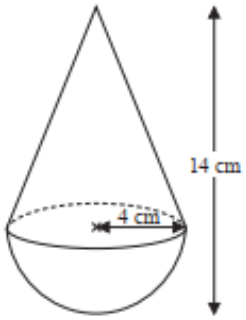


Diagram **NOT** accurately drawn

The radius of the hemisphere is 4 cm.
The radius of the base of the cone is 4 cm.

Calculate the volume of the solid.
Give your answer correct to 3 significant figures.

..... cm^3

(Total for Question 25 is 3 marks)

Pearson Edexcel - Friday 13 June 2014 - Paper 2 (Calculator) Higher Tier

17.

27 $ABCD$ is a parallelogram.

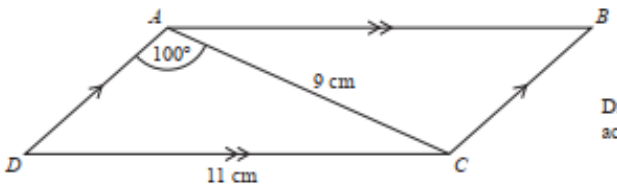


Diagram **NOT** accurately drawn

$AC = 9$ cm
$DC = 11$ cm
Angle $DAC = 100°$

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

..... cm²

(Total for Question 27 is 5 marks)

Pearson Edexcel - Wednesday 6 November 2013 - Paper 1 (Non-Calculator) Higher Tier

18.

3 Here is a triangular prism.

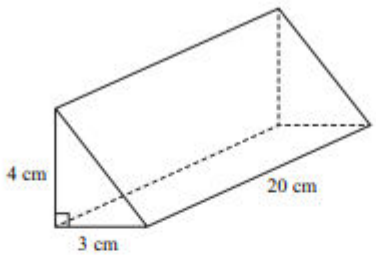


Diagram **NOT** accurately drawn

Work out the volume of this triangular prism.

.....

(Total for Question 3 is 4 marks)

Pearson Edexcel - Friday 14 June 2013 - Paper 2 (Calculator) Higher Tier

19.

1 Here is a cuboid.

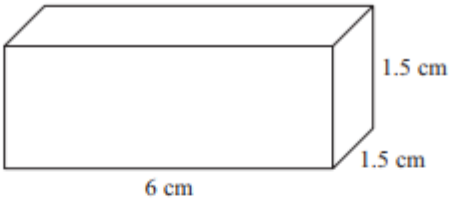


Diagram **NOT** accurately drawn

The cuboid is 6 cm by 1.5 cm by 1.5 cm.

Work out the total surface area of the cuboid.

..... cm^2

(Total for Question 1 is 3 marks)

Pearson Edexcel - Thursday 28 February 2013 - Paper 1 (Non-Calculator) Higher Tier

20.

23 The diagram shows a solid hemisphere of radius 5 cm.

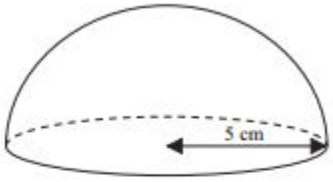


Diagram **NOT** accurately drawn

Find the **total** surface area of the solid hemisphere.
Give your answer in terms of π.

..... cm^2

(Total for Question 23 is 3 marks)

Pearson Edexcel - Monday 4 March 2013 - Paper 2 (Calculator) Higher Tier

21.

15

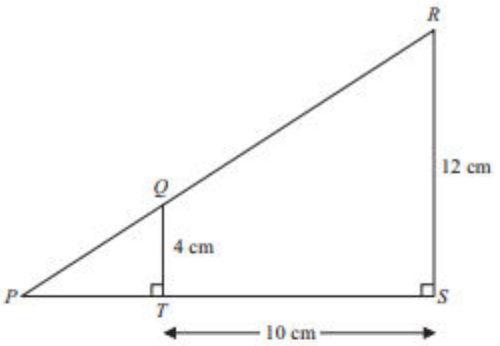


Diagram **NOT** accurately drawn

PQR and *PTS* are straight lines.
Angle *PTQ* = Angle *PSR* = 90°
QT = 4 cm
RS = 12 cm
TS = 10 cm

(a) Work out the area of the trapezium *QRST*.

..... cm²
(2)

(b) Work out the length of *PT*.

..... cm
(3)

(Total for Question 15 is 5 marks)

Pearson Edexcel - Monday 4 March 2013 - Paper 2 (Calculator) Higher Tier

22.

22

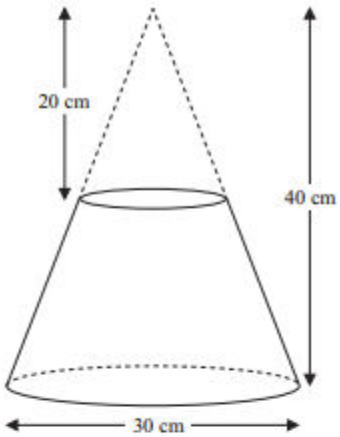


Diagram **NOT** accurately drawn

A frustrum is made by removing a small cone from a similar large cone.

The height of the small cone is 20 cm.
The height of the large cone is 40 cm.
The diameter of the base of the large cone is 30 cm.

Work out the volume of the frustrum.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 22 is 4 marks)

Pearson Edexcel - Tuesday 6 November 2012 - Paper 1 (Non-Calculator) Higher Tier

23.

25 The diagram shows two similar solids, A and B.

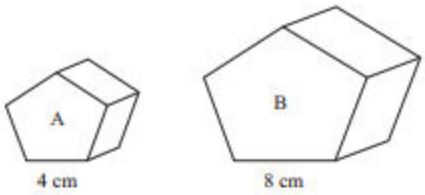


Diagram **NOT** accurately drawn

Solid A has a volume of 80 cm³.

(a) Work out the volume of solid B.

.....cm³

(2)

Solid B has a total surface area of 160 cm².

(b) Work out the total surface area of solid A.

.....cm²

(2)

(Total for Question 25 is 4 marks)

Pearson Edexcel - Thursday 8 November 2012 - Paper 2 (Calculator) Higher Tier

24.

23 The diagram shows a pyramid.

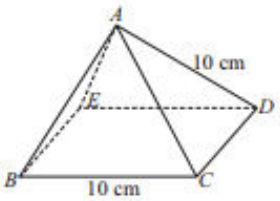


Diagram **NOT** accurately drawn

BCDE is a square with sides of length 10 cm.
The other faces of the pyramid are equilateral triangles with sides of length 10 cm.

(a) Calculate the volume of the pyramid.
Give your answer correct to 3 significant figures.

..... cm^3
(4)

(b) Find the size of angle *DAB*.

.....°
(2)

(Total for Question 23 is 6 marks)

Pearson Edexcel - Monday 11 June 2012 - Paper 1 (Non-Calculator) Higher Tier

25.

25 The diagram shows a solid metal cylinder.

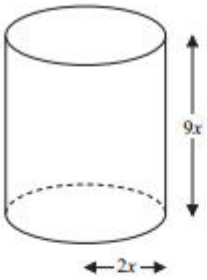


Diagram **NOT** accurately drawn

The cylinder has base radius $2x$ and height $9x$.

The cylinder is melted down and made into a sphere of radius r.

Find an expression for r in terms of x.

.....

(Total for Question 25 is 3 marks)

Pearson Edexcel - Monday 5 March 2012 - Paper 4 (Calculator) Higher Tier

26.

13. *ABCD* is a trapezium.

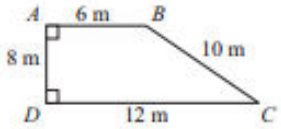


Diagram **NOT** accurately drawn

Work out the area of the trapezium.

..... m^2

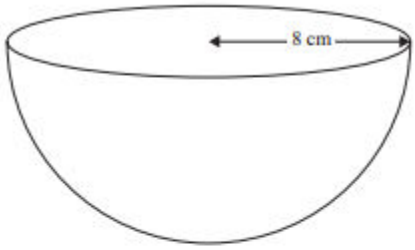
(Total 2 marks)

Pearson Edexcel - Monday 14 November 2011 - Paper 4 (Calculator) Higher Tier

27.

24. The diagram shows a solid hemisphere of radius 8 cm.

Diagram **NOT** accurately drawn



Work out the total surface area of the hemisphere.
Give your answer correct to 3 significant figures.

..... cm^2

(Total 3 marks)

Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

28.

9.

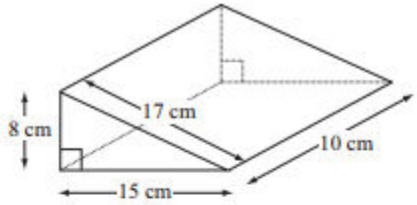


Diagram **NOT** accurately drawn

Work out the **total** surface area of the triangular prism.

.....

(Total 4 marks)

Pearson Edexcel - Friday 10 June 2011 - Paper 4 (Calculator) Higher Tier

29.

20. The table shows some expressions.
a, b, c and d represent lengths.
π and 2 are numbers that have no dimensions.

$c^2(b+d)$	$\pi a^2 c^2$	$\frac{a^3 b}{c^3}$	$\pi a^2 b$	$\frac{2a^3 d}{c}$	d^2	$2a + b^2$

Tick (✓) the boxes underneath the **three** expressions which could represent volumes.

(Total 3 marks)

Pearson Edexcel - Tuesday 9 November 2010 - Paper 3 (Non-Calculator) Higher Tier

30.

19.

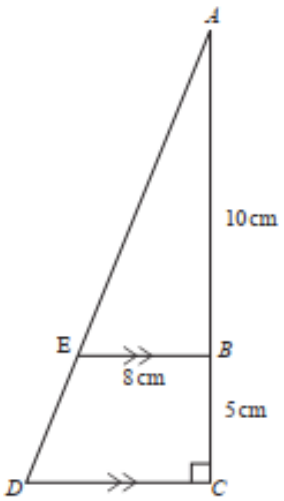


Diagram **NOT** accurately drawn

ABC and *AED* are straight lines.
EB is parallel to *DC*.
Angle *ACD* = 90°.

AB = 10 cm.
BC = 5 cm.
EB = 8 cm.

(a) Work out the length of *DC*.

.....cm
(2)

(b) Work out the area of the trapezium *EBCD*.

.....cm^2
(2)

(Total 4 marks)

Pearson Edexcel - Monday 7 June 2010 - Paper 3 (Non-Calculator) Higher Tier

31.

20. (a) Here are some expressions.

a^3b	$a^2(c + b)$	$4abc$	$ab + c^3$	$4\pi c^2$

The letters a, b, and c represent lengths.
π and 4 are numbers that have no dimension.

Two of the expressions could represent volumes.
Tick the boxes (✓) underneath these two expressions.

(2)

The volume of this cube is 8 m^3.

(b) Change 8 m^3 into cm^3.

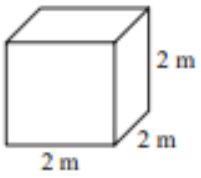


Diagram **NOT** accurately drawn

..... cm^3

(2)

(Total 4 marks)

OCR GSCE – Tuesday 3 November 2020 – Paper 4 (Calculator) Higher Tier

32.

6 A cuboid measures 6 cm by 8 cm by 15 cm.
A cube has the same volume as the cuboid.

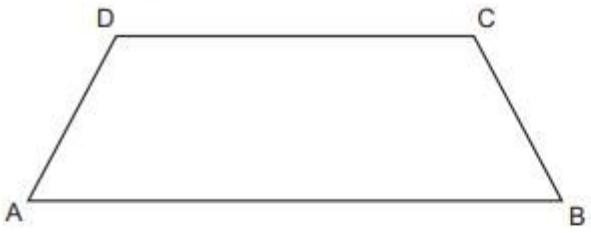
Find the surface area of the cube, giving your answer correct to 3 significant figures.

.....cm^2 **[4]**

OCR GSCE – Thursday 5 November 2020 – Paper 5 (Non-Calculator) Higher Tier

33.

20 ABCD is a trapezium.



Not to scale

The perimeter of the trapezium is 56 cm.
The ratio AD : AB : DC : BC = 5 : 12 : 6 : 5.

Calculate the area of the trapezium.
Show your working.

..... cm^2 **[7]**

OCR GSCE – Tuesday 11 June 2019 – Paper 6 (Calculator) Higher Tier

34.

14 The length of the longest diagonal of a cube is 25 cm.

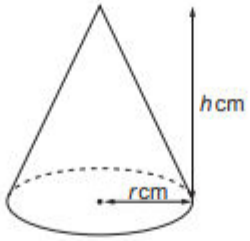
Calculate the total surface area of the cube.

..... cm^2 **[5]**

OCR GSCE – Tuesday 11 June 2019 – Paper 6 (Calculator) Higher Tier

35.

18 A cone has radius r cm and height h cm.



The height is three times the radius.
The volume of the cone is $2100\,\text{cm}^3$.

Calculate the radius of the cone.

[The volume V of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

..... cm **[4]**

OCR GSCE – Wednesday 8 November 2017 – Paper 6 (Calculator) Higher Tier

36.

15 The following formula is for the area, A, of the curved surface area of a cone.
$A = \pi rl$, where r is the radius and l is the slant height of the cone.

Calculate the **total** surface area of a cone with radius 5 cm and slant height 12 cm.

..... cm^2 **[3]**

OCR GSCE – Sample Papers – Paper 4 (Calculator) Higher Tier

37.

2 A circular table top has radius 70 cm.

(a) Calculate the area of the table top in cm^2, giving your answer as a multiple of π.

(a) ..... cm^2 **[2]**

(b) The volume of the table top is $17\,150\pi\,cm^3$.

Calculate the thickness of the table top.

(b) ..... cm **[2]**

OCR GSCE – Sample Papers – Paper 4 (Calculator) Higher Tier

38.

13 The volume of Earth is 1.08×10^{12} km^3.
The volume of Jupiter is 1.43×10^{15} km^3.

How many times larger is the radius of Jupiter than the radius of Earth?
Assume that Jupiter and Earth are both spheres.

[The volume v of a sphere with radius r is $v = \frac{4}{3}\pi r^3$.]

..... **[4]**

OCR GSCE – Sample Papers – Paper 5 (Non - Calculator) Higher Tier

39.

7 The lengths of the sides of two squares are integers, when measured in cm.
The difference between the areas of the two squares is 36 cm^2.

Find the lengths of the sides of the two squares.

..... cm

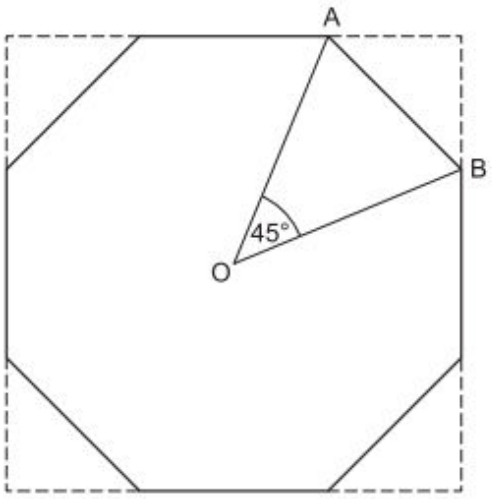
..... cm

[3]

OCR GSCE – Sample Papers – Paper 6 (Calculator) Higher Tier

40.

16 Simon cuts the corners off a square piece of card to leave the regular octagon shown below.
O is the centre of the octagon.
A and B are vertices of the octagon.
OA = OB = 5 cm.
Angle AOB = 45°.



Not to scale

(a) (i) Work out the area of the octagon.

(a)(i) ..... cm^2 **[3]**

(ii) Work out the area of the original square piece of card.

(ii) ..... cm^2 **[5]**

(b) Simon now makes a table top using the card as a model.
The sides of the table top are 8 times as long as the sides of the card model.

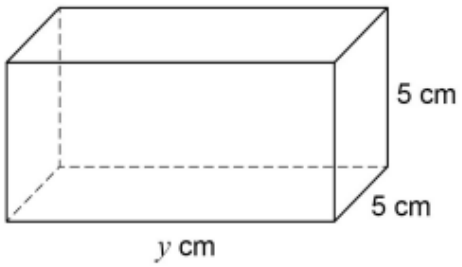
Find the ratio of the **area** of Simon's table top to the **area** of the card model.

(b) ..... : ..... **[2]**

AQA GSCE – Thursday 4 June 2020 – Paper 2 (Calculator) Higher Tier

41.

9 Here is a cuboid.



9 (a) Assume that the total surface area of the cuboid is 200 cm^2

Work out the volume of the cuboid.

[3 marks]

Answer _____ cm^3

9 (b) In fact, the total surface area of the cuboid is smaller than 200 cm^2

What does this mean about the volume of the cuboid?

Tick **one** box.

[1 mark]

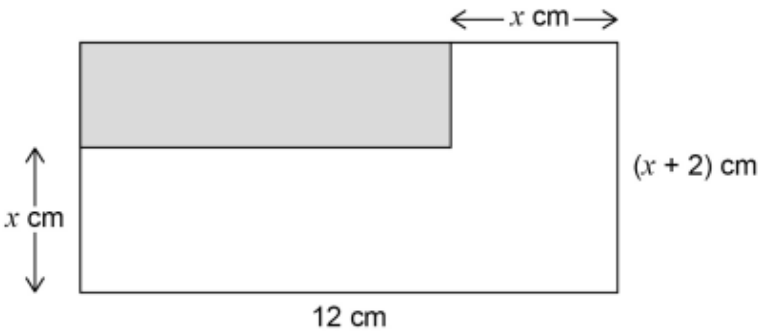
- ☐ It is smaller than the answer to part (a)
- ☐ It is bigger than the answer to part (a)
- ☐ It is the same as the answer to part (a)
- ☐ It could be any of the above

AQA GSCE – Thursday 8 June 2020 – Paper 3 (Calculator) Higher Tier

42.

17 Here are two rectangles.

Not drawn accurately



The area of the shaded rectangle is $\frac{1}{4}$ the area of the large rectangle.

Work out the value of x.

[4 marks]

AQA GSCE – Thursday 6 June 2019 – Paper 2 (Calculator) Higher Tier

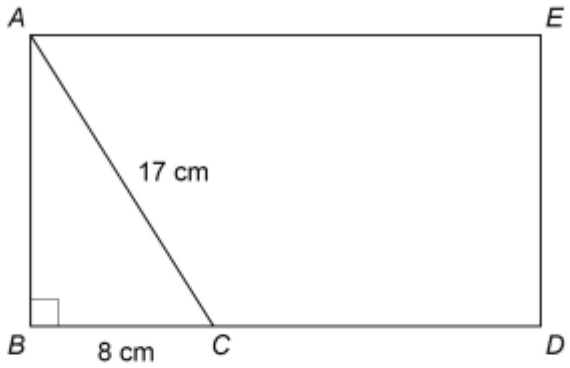
43.

7 The diagram shows rectangle *ABDE* and right-angled triangle *ABC*.

AC = 17 cm

BC = 8 cm

Not drawn accurately



BC : *CD* = 1 : 2

Work out the area of rectangle *ABDE*.

[4 marks]

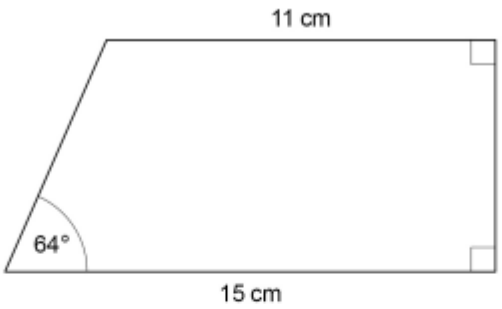
Answer ____ cm^2

AQA GSCE – Thursday 6 June 2019 – Paper 2 (Calculator) Higher Tier

44.

19 Work out the area of the trapezium.

Not drawn accurately



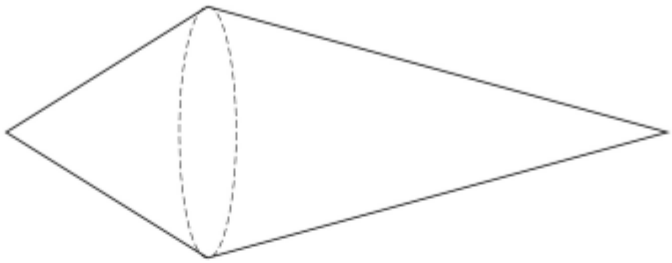
[4 marks]

Answer _____ cm^2

AQA GSCE – Thursday 6 June 2019 – Paper 2 (Calculator) Higher Tier

45.

21 A solid shape is made by joining two cones.
Each cone has the same radius.



One cone has slant height = 2 × radius
The other cone has slant height = 3 × radius

The total surface area of the shape is 57.8π cm^2

Curved surface area of a cone = πrl where r is the radius and l is the slant height

Work out the radius.

[3 marks]

Answer _____ cm

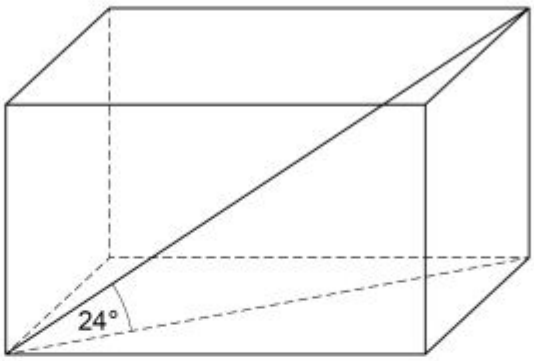
AQA GSCE – Tuesday 11 June 2019 – Paper 3 (Calculator) Higher Tier

46.

24 The length of a diagonal of a cuboid is 20 cm

The diagonal makes an angle of 24° with the base.

The area of the base is 150 cm^2



Work out the volume of the cuboid.

[3 marks]

Answer _____ cm^3

AQA GSCE – Tuesday 6 November 2018 – Paper 1 (Non - Calculator) Higher Tier

47.

2 Circle the volume, in cm^3, of a cylinder with radius 5 cm and height 8 cm

[1 mark]

40π 80π 200π 1600π

AQA GSCE – Monday 12 November 2018 – Paper 3 (Calculator) Higher Tier

48.

24

Volume of a sphere $= \frac{4}{3}\pi r^3$	where r is the radius
Volume of a cone $= \frac{1}{3}\pi r^2 h$	where r is the radius and h is the perpendicular height

A sphere has radius $2x$ cm

A cone has

radius $3x$ cm

perpendicular height h cm

The sphere and the cone have the same volume.

Work out radius of cone : perpendicular height of cone

Give your answer in the form $a : b$ where a and b are integers.

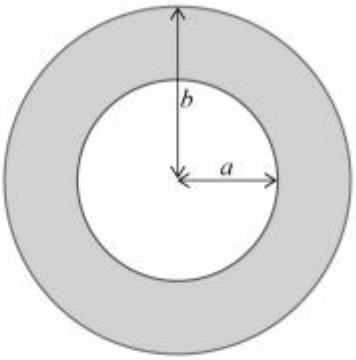
[4 marks]

Answer :

AQA GSCE – Thursday 7 June 2018 – Paper 2 (Calculator) Higher Tier

49.

20 Here is an inflated swimming ring with dimensions in centimetres.



The volume of the ring, V cm^3, is given by

$$V = 0.25\pi^2(b - a)^2(b + a)$$

Work out the volume when $a = 20$ and $b = 30$

Give your answer to 3 significant figures.

[3 marks]

Answer _____ cm^3

AQA GSCE – Thursday 7 June 2018 – Paper 2 (Calculator) Higher Tier

50.

23 Solids X and Y are similar.

X has volume 64 cm^3

Y has volume 343 cm^3

The surface area of X is 176 cm^2

Work out the surface area of Y.

[3 marks]

Answer _____ cm^2

AQA GSCE – Tuesday 12 June 2018 – Paper 3 (Calculator) Higher Tier

51.

13 Tick **all** the statements that are true for any rhombus.

[1 mark]

- ☐ The diagonals are lines of symmetry
- ☐ The diagonals bisect each other
- ☐ The diagonals are perpendicular
- ☐ The diagonals are equal in length

AQA GSCE – Thursday 2 November 2017 – Paper 1 (Non - Calculator) Higher Tier

52.

17 A and B are **similar** solids.

Solid	length (cm)
A	l
B	$2l$

Alex says,

"The volume of B is double the volume of A
because the length of B is double the length of A."

Is he correct?

Tick a box.

Yes ☐ No ☐

Give a reason for your answer.

[1 mark]

_____

_____

AQA GSCE – Wednesday 25 May 2017 – Paper 1 (Non - Calculator) Higher Tier

53.

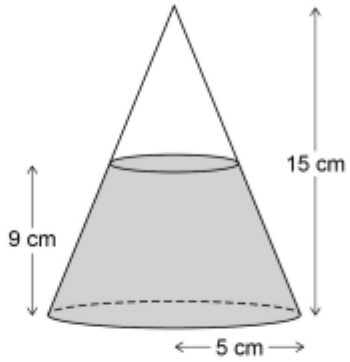
28 Volume of cone = $\frac{1}{3}\pi r^2 h$ where r is the radius and h is the perpendicular height.

A cone has a

horizontal base of radius 5 cm

height of 15 cm

The cone contains water to a depth of 9 cm



Work out the volume of the water, in cm^3

Give your answer in terms of π.

[4 marks]

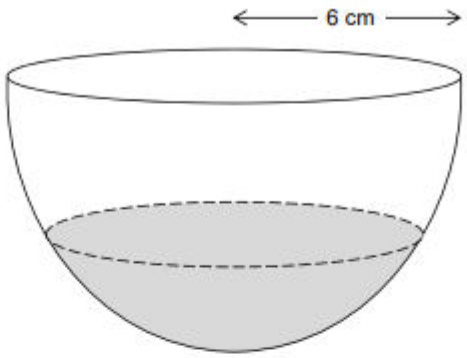
Answer cm^3

AQA GSCE – Sample Paper 2 (Calculator) Higher Tier

54.

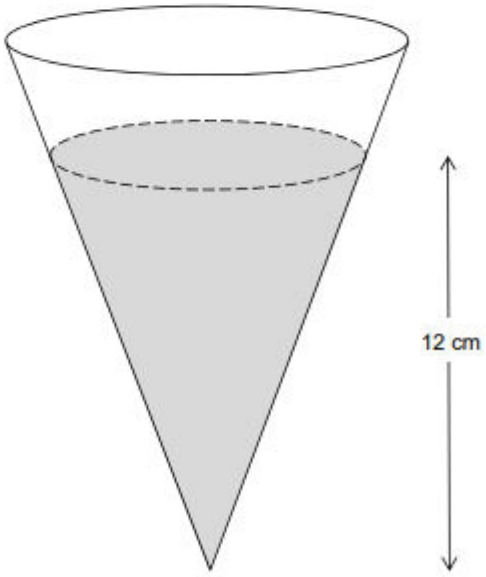
23 A bowl is a hemisphere with radius 6 cm

Water fills two-fifths of the volume of the bowl.



The water is poured into a hollow cone.

The depth of the water in the cone is 12 cm



Volume of a sphere $= \frac{4}{3}\pi r^3$	where r is the radius.
Volume of a cone $= \frac{1}{3}\pi r^2 h$	where r is the radius and h is the perpendicular height

Work out the radius of the surface of the water in the cone.

[4 marks]