Stewards Academy

Maths Autumn 1

Year 11 Foundation

Blended Learning Booklet

Name:

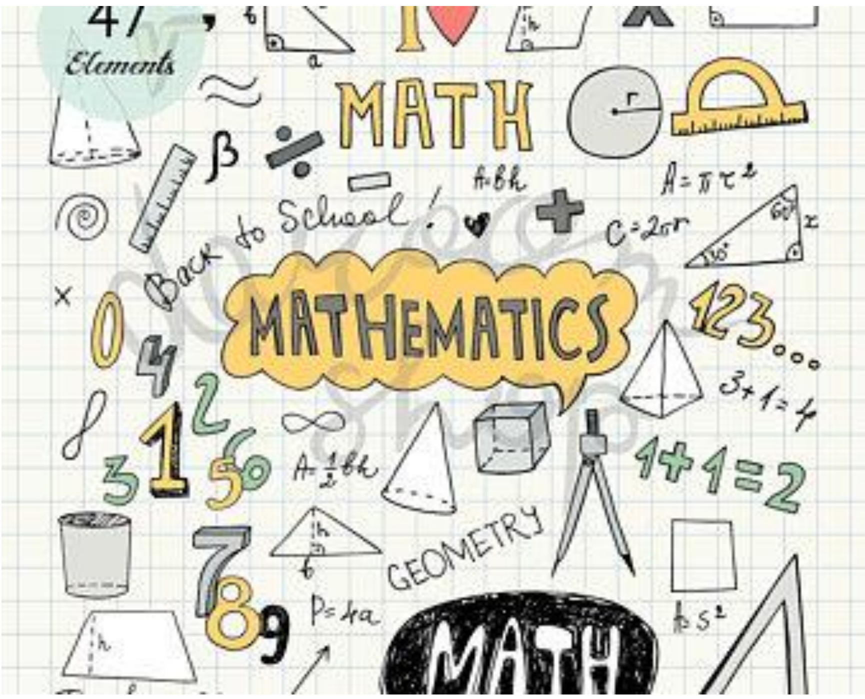
Form:

Each week covers topics you would complete in your 3 Maths lessons that week. Write out the title and LI and then complete the tasks.

All video links are online using the ClassCharts link.

The Knowledge Organiser on page 4 has further practice questions and page numbers linking to your pocket revision guides for all the key information and examples to help you with this unit.

Upload all work onto ClassCharts for feedback.



Contents

Knowledge Organiser

Stewards Academy

Week 1: Expanding Brackets

- **LI: Expand products of binomials**

Demonstration Videos:
https://corbettmaths.com/2013/12/23/expanding-brackets-video-13/
https://corbettmaths.com/2013/12/23/expanding-two-brackets-video-14/

Expanding Brackets

To expand one bracket, make sure the term on the outside multiplies **everything** on the inside,

e.g. $4(2x - 3) = 8x - 12$

To expand two brackets, follow the F.O.I.L. method (First, Outer, Inner, Last), e.g.

$(x + 3)(x + 5) = x^2 + 5x + 3x + 15$
$= x^2 + 8x + 15$

Expand & Simplify:

$$3(2x + 5)$$

$\times$	$2x$	$+5$
3	$6x$	$+15$

$$6x + 15$$

Expand & Simplify:

$$(x - 2)(x - 2)$$

$\times$	x	-2
x	x^2	$-2x$
-2	$-2x$	$+4$

$$x^2 - 2x - 2x + 4$$

$$x^2 - 4x + 4$$

Tasks:

Name

Expanding brackets

4x - 2	42x + 21	15x - 10	8x - 6	10x - 5
14x - 14	6x - 2	9x - 6	18x - 18	2x + 4
12x + 8	12x - 8	8x - 4	15x - 18	6x + 9
12x+ 9	6x - 3	10x + 4	20x + 15	15x + 9
9x + 6	12x - 12	30x + 18	20x + 16	6x + 6

2(5x + 2)	6(2x - 2)	4(3x + 2)	3(2x - 1)
3(3x - 2)	2(2x - 1)	2(1x + 2)	6(5x + 3)
7(2x - 2)	2(3x - 1)	5(2x - 1)	5(4x + 3)
4(2x - 1)	6(3x - 3)	4(5x + 4)	4(3x - 2)
5(3x - 2)	7(6x + 3)	3(5x + 3)	3(2x + 2)

TOTAL

$4(2x+3) \rightarrow$ $5(6x+1) \rightarrow$ $2(3x-5) \rightarrow$	$(x+2)(x+5)$	$(2x+3)(x+5)$
$2(4-3x) \rightarrow$ $(4-3x)4 \rightarrow$ $5(2x+4y-2) \rightarrow$	$(x+4)(x-2)$	$(2x+4)(x-3)$
$3(5x+2)-4x \rightarrow$ $3(4x+3)+2(5x-3) \rightarrow$ $(5x+2)4-3(5x+6) \rightarrow$	$(x-5)(x+4)$	$(x-5)(2x-4)$
	$(x-3)(x-6)$	$(2x+3)(2x-6)$
	$(2x+3)(x-2)$	$(3x-4)(2x-3)$

★	★★	★★★
1) $(x+2)(x+3)$	**1)** $(x-2)(x-1)$	**1)** $(x+1)(x-3)$
2) $(x+1)(x+3)$	**2)** $(x-1)(x-3)$	**2)** $(x-2)(x+5)$
3) $(x+1)(x+1)$	**3)** $(x-2)(x-3)$	**3)** $(x+3)(x-6)$
4) $(x+4)(x+3)$	**4)** $(x-5)(x-4)$	**4)** $(x+2)(x-5)$
5) $(x+2)(x+5)$	**5)** $(x-2)(x-2)$	**5)** $(x-1)(x+8)$
6) $(x+7)(x+4)$	**6)** $(x-1)(x-5)$	**6)** $(x-4)(x+4)$
7) $(x+5)(x+1)$	**7)** $(x-2)(x-7)$	**7)** $(x-8)(x+3)$
8) $(x+3)(x+3)$	**8)** $(x-5)(x-5)$	**8)** $(x+9)(x-3)$

Exam Practice:
https://corbettmaths.com/wp-content/uploads/2013/02/expanding-brackets-pdf.pdf
https://corbettmaths.com/wp-content/uploads/2013/02/expanding-two-brackets-pdf1.pdf

Challenge:

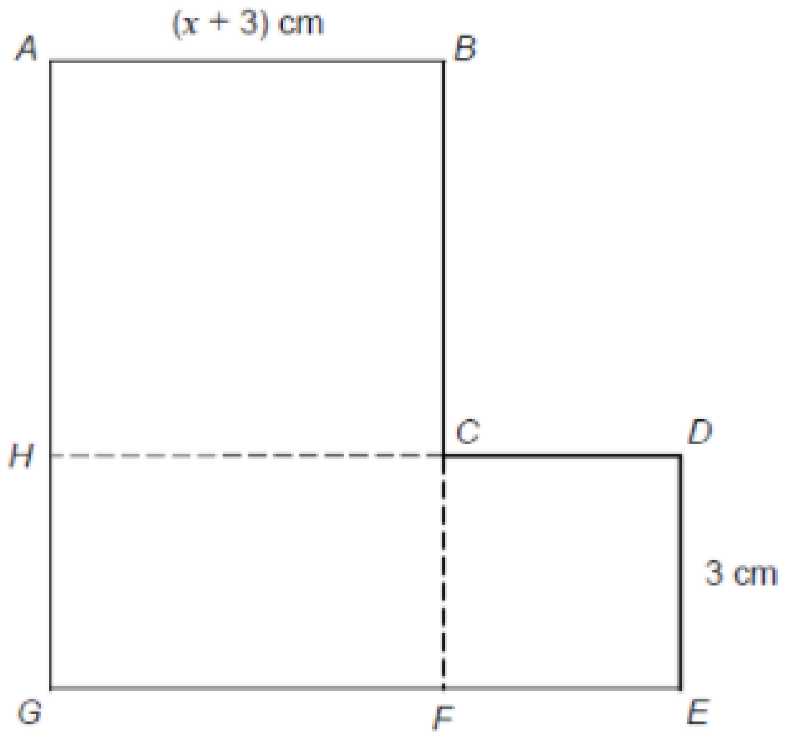
ABCH is a square.

HCFG is a rectangle.

CDEF is a square.

They are joined to make an L-shape.

Not drawn accurately



Show that the total area of the L-shape, in cm², is $x^2 + 9x + 27$

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Week 2: Factorising

- **LI: Factorise quadratic expressions including the difference of two squares**

Demonstration Videos:
https://corbettmaths.com/2013/02/06/factorisation/
https://corbettmaths.com/2013/02/06/factorising-quadratics-1/
https://corbettmaths.com/2013/02/08/difference-between-two-squares/

Factorise:

$$6x + 4$$

1) Find the HCF of the terms.

2) Divide each term by the HCF.

$$\frac{6x}{2} = 3x \qquad \frac{4}{2} = 2$$

$$2\,(\,3x + 2\,)$$

We can check by expanding the bracket.

Factorise:

$$x^2 + 9x + \underline{20}$$

1) List number pairs with a product of +20.

1 and 20
2 and 10
4 and 5

2) Find the pair with a sum of +9.

$$(\,x\ +4\ )\,(\,x\ +5\ )$$

We can check by expanding the brackets.

Factorise:

$$x^2 - 4x - \underline{12}$$

1) List number pairs with a product of −12.

1 and −12
−1 and 12
2 and −6
−2 and 6
−3 and 4
3 and −4

2) Find the pair with a sum of −4.

$$(\,x\ +2\ )\,(\,x\ -6\ )$$

We can check by expanding the brackets.

Tasks:

★	★★	★★★
Factorise	Factorise	Factorise
1) $2x + 4$	**1)** $12x + 15$	**1)** $5x^2 + 10x$
2) $6x + 12$	**2)** $15x - 20$	**2)** $12x^2 + 18x$
3) $8x - 16$	**3)** $24x + 18$	**3)** $15x^2 - 10x$
4) $8x + 4$	**4)** $36 - 15x$	**4)** $60x - 25x^2$
5) $12x + 3$	**5)** $48 + 20x$	**5)** $21x^2 - 49x$
6) $14 + 7x$	**6)** $30x + 35$	**6)** $24x^2 - 42x$
7) $5x + 30$	**7)** $28x - 49$	**7)** $30x^2 - 15x$
8) $20 - 5x$	**8)** $30 - 40x$	**8)** $8x - 32x^2$

Factorise the expressions into two brackets.
Watch out!
There are extra answers that are not needed!

$x^2 + 3x - 10$	$(x+3)(x-5)$
$(x+3)(x+5)$	$x^2 - 10x + 16$
$x^2 + 8x + 15$	$x^2 + 6x - 7$
$(x+6)(x+3)$	$(x-3)(x-5)$
$(x-2)(x+4)$	$(x+5)(x-2)$
$x^2 + 9x + 20$	$(x+4)(x+4)$
$(x+7)(x-1)$	$(x-3)(x-6)$
$x^2 + 9x + 18$	$x^2 - 8x + 15$
$(x-2)(x-8)$	$(x+2)(x-4)$
$(x+4)(x+5)$	$x^2 - 2x - 8$

★

Factorise

1) $x^2 + 3x + 2$
2) $x^2 + 5x + 6$
3) $x^2 + 4x + 3$
4) $x^2 + 7x + 10$
5) $x^2 + 8x + 16$
6) $x^2 + 8x + 12$
7) $x^2 + 8x + 16$
8) $x^2 + 11x + 10$

★★

Factorise

1) $x^2 - 5x + 6$
2) $x^2 - 7x + 10$
3) $x^2 - 11x + 10$
4) $x^2 - 8x + 12$
5) $x^2 - 7x + 12$
6) $x^2 - 6x + 8$
7) $x^2 - 4x + 4$
8) $x^2 - 11x + 30$

★★★

Factorise

1) $x^2 - x - 12$
2) $x^2 + 4x - 12$
3) $x^2 - 9x - 10$
4) $x^2 - x - 20$
5) $x^2 - 4$
6) $x^2 - 4x - 21$
7) $x^2 + x - 20$
8) $x^2 - x - 56$

★★

Factorise

1) $x^2 - 9$
2) $x^2 - 4$
3) $x^2 - 100$
4) $x^2 - 1$
5) $x^2 - 16$
6) $x^2 - 36$
7) $x^2 - 64$
8) $x^2 - 121$

Exam Practice:
https://corbettmaths.com/wp-content/uploads/2013/02/factorising-quadratics.pdf

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Week 3: Solving Quadratic Equations

- **LI: Set up and solve quadratic equations**

Demonstration Video:
https://corbettmaths.com/2013/05/03/solving-quadratics-by-factorising/

Solve:

$$x^2 + 7x + 12 = 0$$

b ***c***

b = *sum* of number pair
c = *product* of number pair

List factors of ***c***,
find a pair with a sum of ***b***.

+12, +1	+6, +2	+4, +3
−12, −1	−6, −2	−4, −3

$$(\ x \ \ +4 \ \ )(\ x \ \ +3 \ \ ) \ = 0$$

$(x+4)=0 \qquad x=-4$

OR

$(x+3)=0 \qquad x=-3$

Solve:

$$x^2 + 5x - 24 = 0$$

b ***c***

b = *sum* of number pair
c = *product* of number pair

List factors of ***c***,
find a pair with a sum of ***b***.

+24, −1	+12, −2	+8, −3	+6, −4
−24, +1	−12, +2	−8, +3	−6, +4

$$(\ x \ \ +8 \ \ )(\ x \ \ -3 \ \ ) \ = 0$$

$(x+8)=0 \qquad x=-8$

OR

$(x-3)=0 \qquad x=3$

Solve:

$$x^2 - 12x + 20 = 0$$

b ***c***

b = *sum* of number pair
c = *product* of number pair

List factors of ***c***,
find a pair with a sum of ***b***.

+20, +1	+10, +2	+5, +4
−20, −1	−10, −2	−5, −4

$$(\ x \ \ -10\ )(\ x \ \ -2 \ \ ) \ = 0$$

$(x-10)=0 \qquad x=10$

OR

$(x-2)=0 \qquad x=2$

Tasks:

Option A: • Cut out all the cards. • Sort the equations into those that can and cannot be factorised • Match the answers to the equations which can be solved by factorising		Factorising and solving	**Option B:** Solve by factorising to match the equations to the solutions	
$x=0 \quad x=12$	$x^2+x-2=0$	$x^2-2x+8=0$	$x^2-x-12=0$	$x=-2 \quad x=10$
$x=2 \quad x=-4$	$x^2-6x-8=0$	$x^2-8x-10=0$	$x=1 \quad x=-2$	$x^2-5x+24=0$
$x^2-9x+20=0$	$x=-1 \quad x=12$	$x^2-10x-12=0$	$x^2-2x-24=0$	$x=0 \quad x=-12$
$x^2-11x+24=0$	$x^2-12x=0$	$x^2+6x+8=0$	$x^2-8x-20=0$	$x=3 \quad x=8$
$x^2+x-12=0$	$x=5 \quad x=4$	$x^2+5x-24=0$	$x^2-11x-12=0$	$x^2+2x-8=0$
$x=2 \quad x=10$	$x^2-12x+20=0$	$x^2-x+1=0$	$x=-2 \quad x=-4$	$x=-8 \quad x=3$
$x=-3 \quad x=4$	$x^2+12x=0$	$x=-4 \quad x=6$	$x^2-12=0$	$x=3 \quad x=-4$

Solving Quadratic Equations: Inspection

a) $x^2 + 8x + 7 = 0$

b) $x^2 + 10x - 11 = 0$

c) $x^2 - 10x + 25 = 0$

d) $x^2 + 2x - 63 = 0$

e) $x^2 + 11x - 60 = 0$

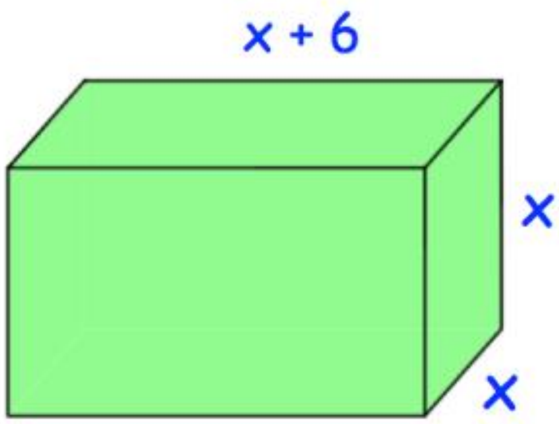
f) $x^2 - 18x + 80 = 0$

g) $x^2 - x - 72 = 0$

h) $x^2 - 8x = 84$

Exam Practice:
https://www.mathsgenie.co.uk/resources/86_solving-quadratics-by-factorising.pdf

Challenge:



The surface area of the cuboid is 270cm^2.

(a) Show $x^2 + 4x - 45 = 0$

(b) Find x.

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Week 4: Rearranging Formulae

- **LI: Rearrange formulae to change the subject**

Demonstration Videos and Examples:
https://www.mathsgenie.co.uk/changing-the-subject1.html
https://corbettmaths.com/2013/12/23/changing-the-subject-video-7/

For each formula, rearrange it so a is by itself.

$$a + b = 9 \quad \xrightarrow{-b} \quad a = 9 - b$$

$$5a = b \quad \xrightarrow{\div 5} \quad a = \frac{b}{5}$$

$$a + 2b = 5b \quad \xrightarrow{-2b} \quad a = 3b$$

$$6 - 9b = 3a \quad \xrightarrow{\div 3} \quad 2 - 3b = a$$

$$6b + 2a = 3a \quad \xrightarrow{-2a} \quad 6b = a$$

$$\frac{a}{3} = b + 2 \quad \xrightarrow{\times 3} \quad a = 3b + 6$$

More difficult examples:

When solving equations & rearranging formula we want a single variable, by itself, on one side of the equals sign.

We want a 'by itself'

$$\frac{a+5}{2} = 3b$$

$\times 2$ $\qquad$ $\times 2$

$$a + 5 = 6b$$

-5 $\qquad$ -5

$$a = 6b - 5$$

When solving equations & rearranging formula we want a single variable, by itself, on one side of the equals sign.

We want a 'by itself'

$$\frac{a}{3} - 4 = 2b + 1$$

$+4$ $\qquad$ $+4$

$$\frac{a}{3} = 2b + 5$$

$\times 3$ $\qquad$ $\times 3$

$$a = 6b + 15$$

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Tasks:

In each question, make x the subject of the formula.

BRONZE

1) $y = x + 21$
2) $x - 19 = y$
3) $y = x + 0.74$
4) $y = x - p$
5) $y = 4x$
6) $y = 1000x$
7) $y = \frac{x}{3}$
8) $y = \frac{x}{41}$
9) $y = -x$
10) $x + 5q = y$

SILVER

1) $6y = 3x$
2) $2x = 10y$
3) $x + 1 = y + 4$
4) $4y = 8x$
5) $6y = 24x$
6) $10x = 100y$
7) $4y = \frac{x}{3}$
8) $3y = 4x$
9) $7x = 9y$
10) $y = x^2$

GOLD

1) $y = 2x + 1$
2) $y = 4x + 9$
3) $12x + 3 = y$
4) $6x - 8 = y$
5) $y = 5x + 0.3$
6) $y = \frac{x}{2} + 1$
7) $y = \frac{x}{6} + 7$
8) $\frac{x}{3} - 1 = y$
9) $y = -x + 3$
10) $-x - 4 = y$

PLATINUM

1) $y = x^2 + 4$
2) $y + 3 = x^2$
3) $y = (x + 3)^2$
4) $x - 2y + 4 = 0$
5) $3x - 9y + 6 = 0$

Exam Practice:
https://corbettmaths.com/wp-content/uploads/2013/02/changing-the-subject-pdf.pdf

Exam Practice Challenge:
https://www.mathsgenie.co.uk/resources/5-changing-the-subject-ws.pdf

Stewards Academy

Week 5: Area

- **LI: Know the various formula for finding the area of a 2D shape**

Area

The space contained within a 2D shape, given by cm^2 or m^2.

Area of a rectangle = width × height

Area of a triangle = (width × height) ÷ 2

Area of a parallelogram = width × vertical height

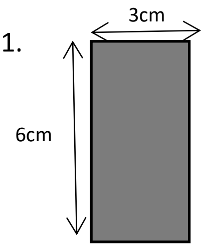
Area of a trapezium = $\frac{1}{2}(a + b)h$

Area of a circle = πr^2

Demonstration Videos:

https://corbettmaths.com/2013/12/20/area-of-a-rectangle-video-45/
https://corbettmaths.com/2013/12/21/area-of-a-parallelogram-video-44/
https://corbettmaths.com/2013/12/20/area-of-a-triangle-video-49/
https://corbettmaths.com/2012/08/02/area-of-a-trapezium-video/
https://corbettmaths.com/2013/03/26/area-of-an-l-shape/
https://corbettmaths.com/2012/08/02/area-of-compound-shapes/
https://corbettmaths.com/2013/12/22/area-of-a-circle-video-40-and-59/

Bronze: Find the area and perimeter of the shapes below. Don't forget your units!

1.


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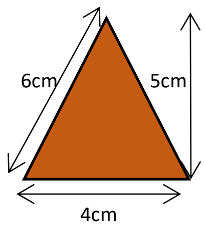

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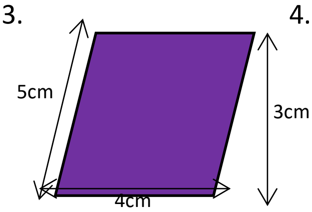

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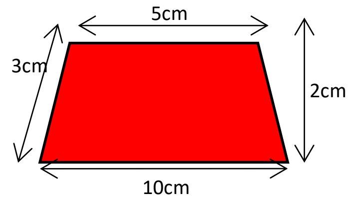

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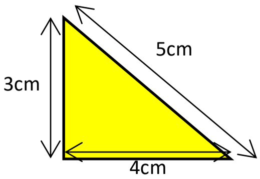

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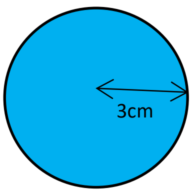

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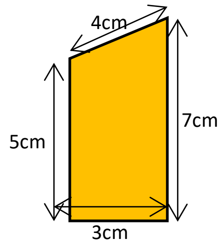

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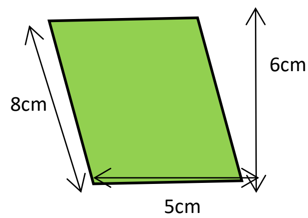

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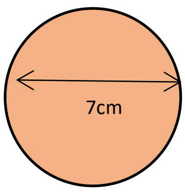

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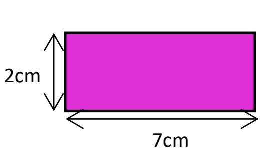

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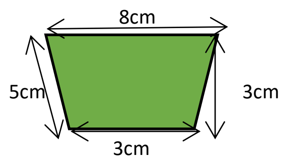

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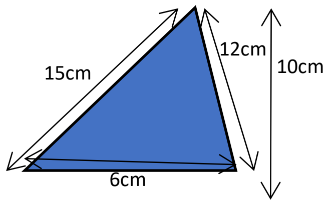

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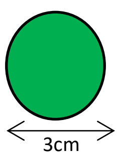

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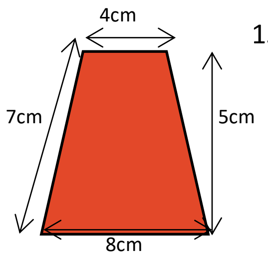

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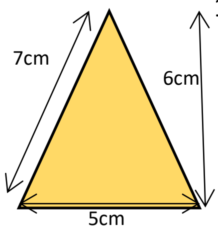

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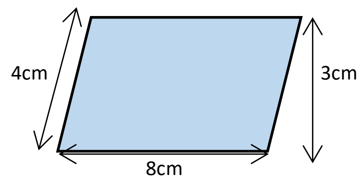
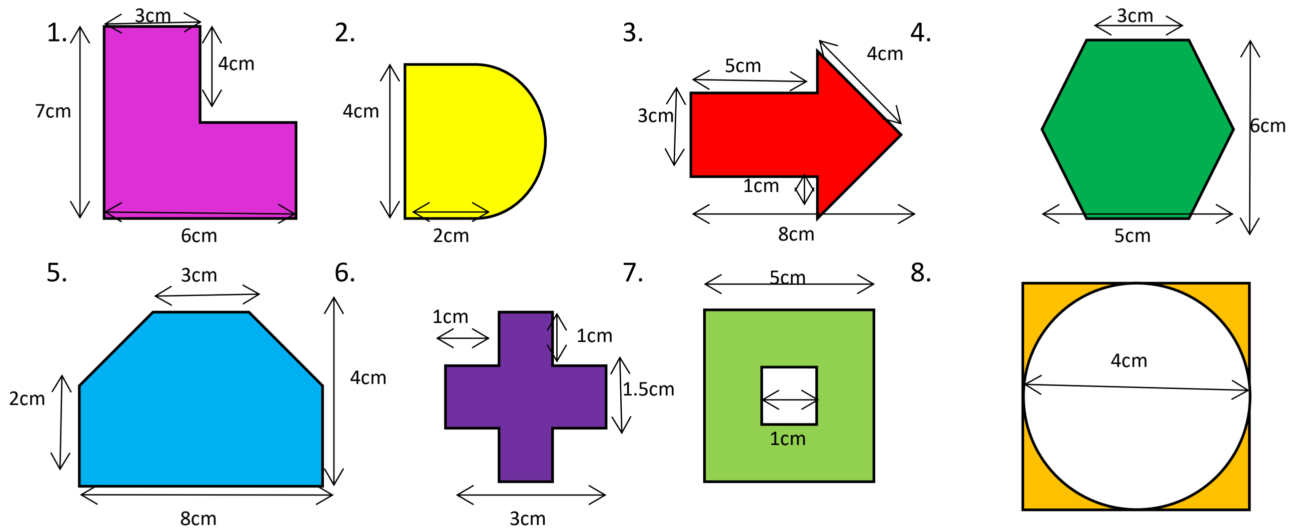
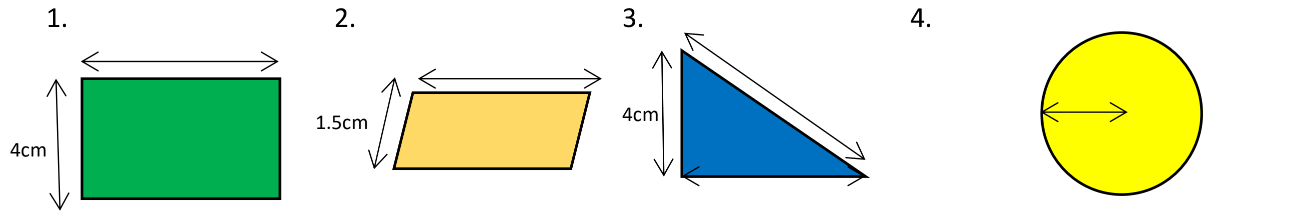


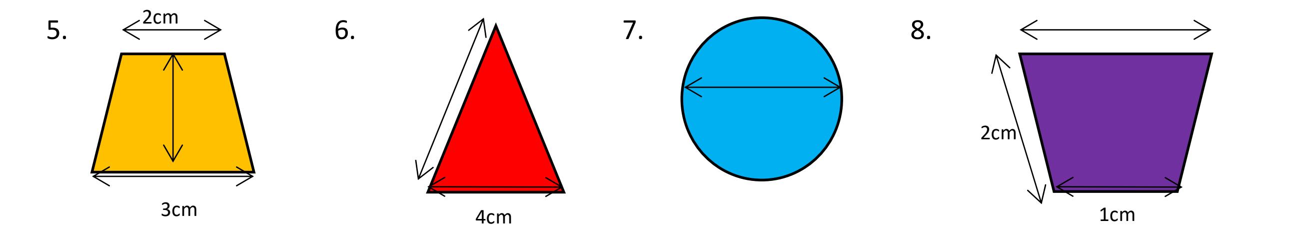
Silver: Find the area of the shapes below by splitting them up into shapes you know how to find the area of, then adding their areas together.



Gold: Find the marked missing lengths in the shapes below.



Area = $12cm^2$ Perimeter = 15cm Area = $24cm^2$ Circumference = 50cm



Area = $5cm^2$ Perimeter = 20cm Area = $15cm^2$ Perimeter = 10cm

Platinum: For each question below, determine if you need to find the area and perimeter of the shapes, then draw a sketch and use this to help you answer the question.

1. Farmer Giles is building a new rectangular pen for his sheep. It is 4m long and 3m wide. It costs £5 for 1m of fencing and £4 for hay which covers $1m^2$. How much does he need to spend in total?
2. I buy a round dining table for my kitchen and I am painting blue to match my curtains. The table is 1.2m across at its widest point. 1 tin of paint, costing £4.99 covers $1m^2$ of table. How much do I need to spend?
3. I am out for a Sunday afternoon walk. I walk 3km East, 4km North, then walk directly back to where I started. Calculate:
   a) The area contained by my path
   b) The total length I walk.

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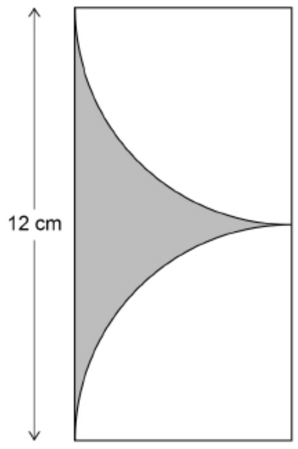
Challenges :

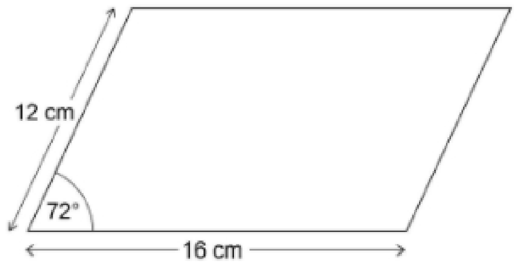
Two identical quarter circles are cut from a rectangle as shown.



Not drawn accurately

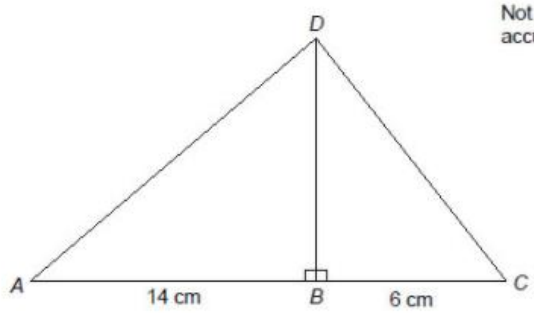
Work out the shaded area.

Work out the area of the parallelogram.



Not drawn accurately

In the diagram the area of triangle ABD is 56 cm^2

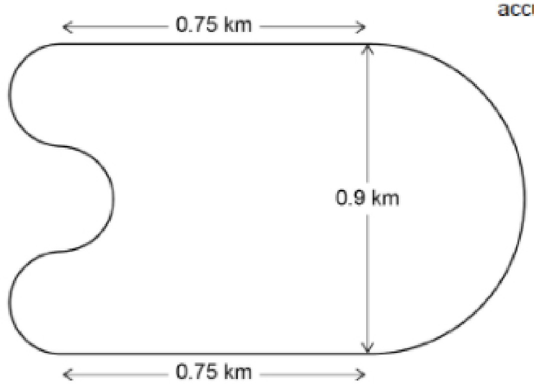


Not drawn accurately

Work out the length of CD.

A motor racing circuit consists of

two parallel straight sections, each of length 0.75 km
a semicircle of diameter 0.9 km
three equal, smaller semicircles.



Not drawn accurately

The length of a motor race must be greater than 305 km

What is the lowest number of **full** laps needed at this circuit?

You **must** show your working.

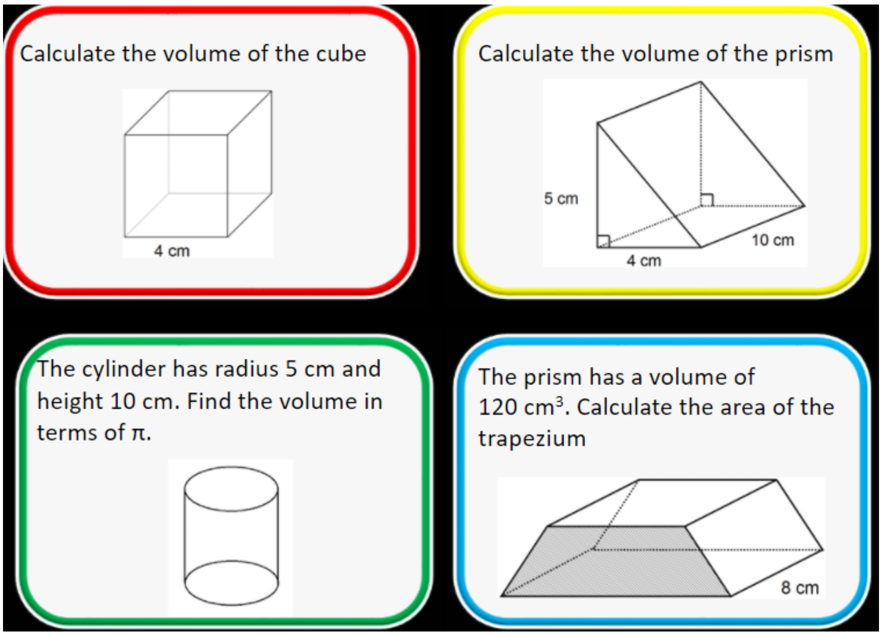
Stewards Academy

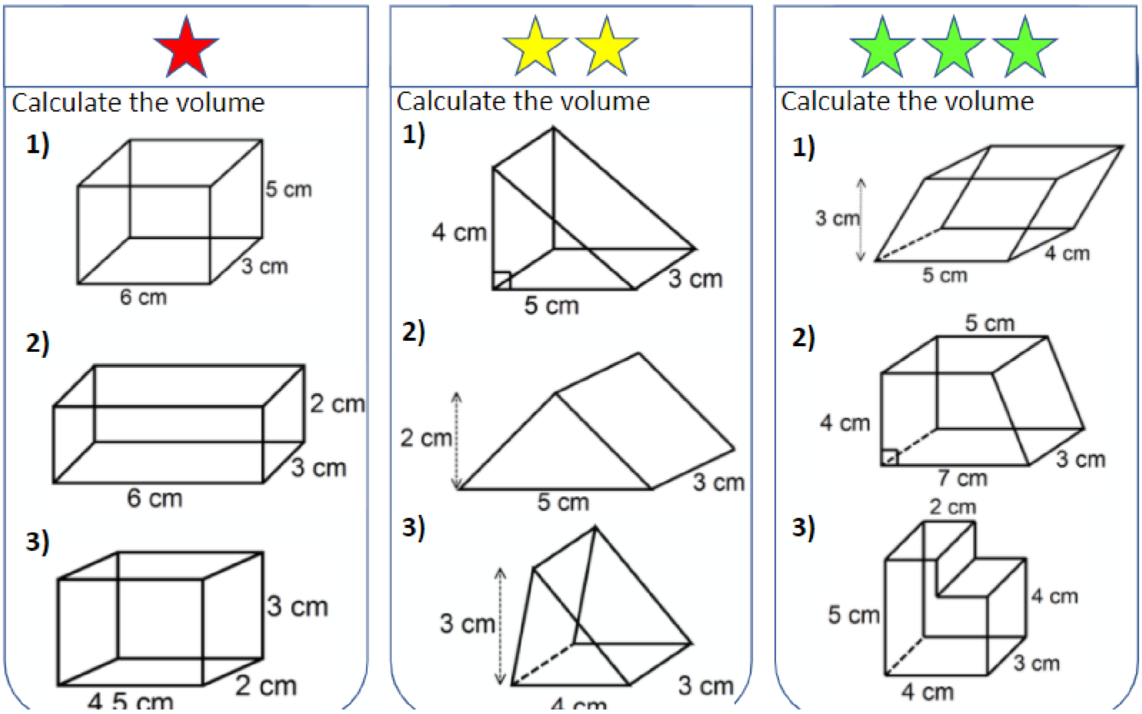
Week 6: Volume

- **LI: Understand that volume can be calculated by multiplying the cross-sectional area of a 3D shape by the length and solve problems involving volume of 3D shapes**

Demonstration Videos:
https://corbettmaths.com/2012/08/09/volume-of-cuboids-and-cubes/
https://corbettmaths.com/2013/04/20/volume-of-a-prism/
https://corbettmaths.com/2013/03/24/volume-of-an-l-shape-prism/
https://corbettmaths.com/2013/02/15/volume-of-a-cylinder/
https://www.mathsgenie.co.uk/volume.html

Tasks:

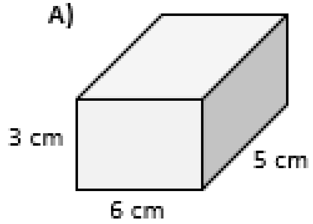




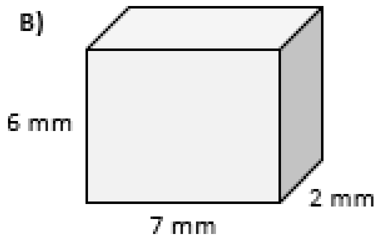
Volume of a Cuboid

Calculate the volume of these cuboids.

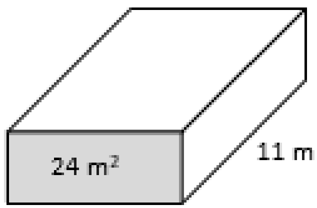
A)



B)

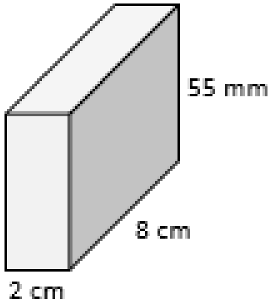


C)



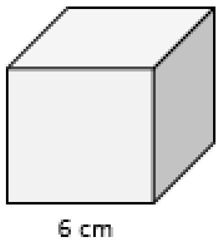
The area of the face of this prism is 24 m^2.

D)



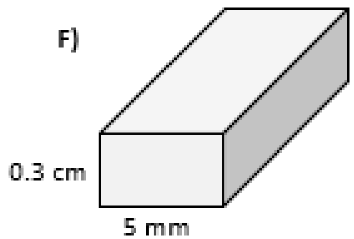
This is a cube.
What is its volume?

E)



The volume of this cuboid is 105 mm^3.
What is the cuboid's length?

F)



G) The volume of a cuboid is 64 m^3.
Its height is twice its width.
Its length is twice its height.
What are the cuboid's dimensions?

Complete the table for cuboids A to E.

Cuboid	Width	Height	Length	Volume
A	5 cm	7 cm	5.5 cm	
B	6 cm	45 mm		189 cm^3
C		6 m	450 cm	94.5 m^3
D	8.5 mm		7 mm	148.75 mm^3
E	2.4 cm	32 mm	0.067 m	

F) These are the side lengths of cubes. Calculate their volumes.

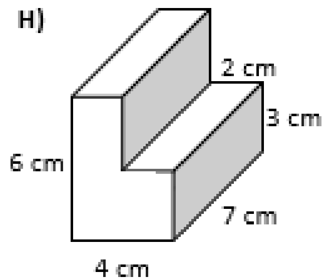
a) 8 cm
b) 5 mm
c) 3.5 m
d) 0.5 cm

G) These are the volumes of cubes. Calculate their side lengths.

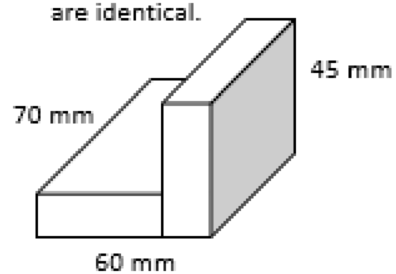
a) 64 cm^3
b) 125 m^3
c) 343 mm^3
d) 729 cm^3

Calculate the volume of these 3 compound cuboids.

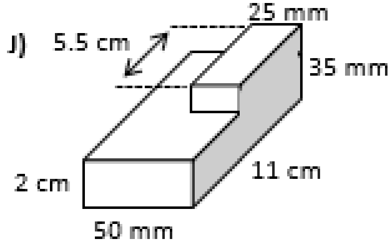
H)

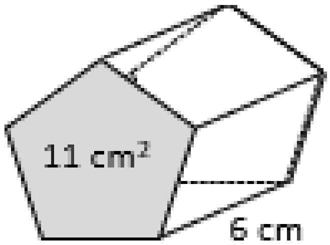


I) These two attached cuboids are identical.

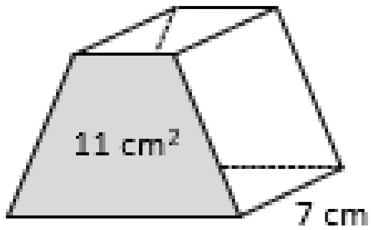


J)

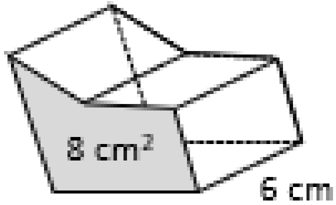




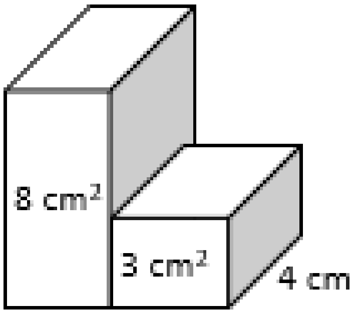
E) V =



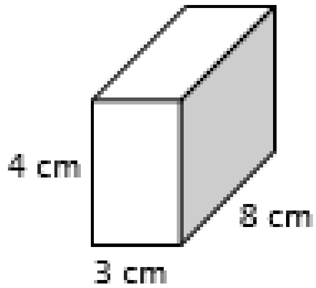
F) V =



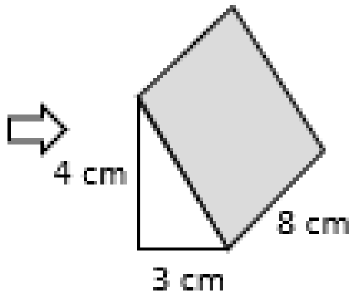
G) V =



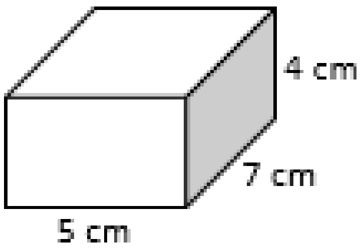
H) V =



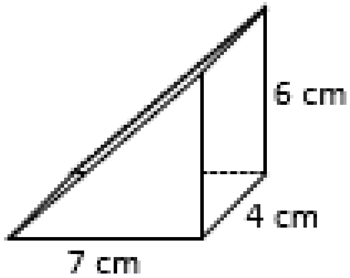
I) V =



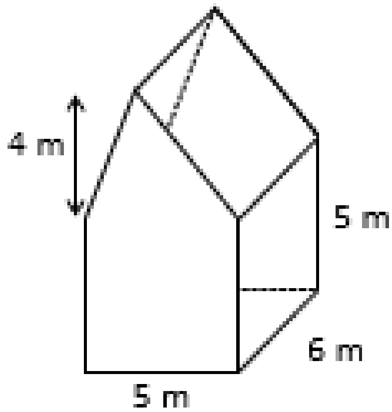
J) V =



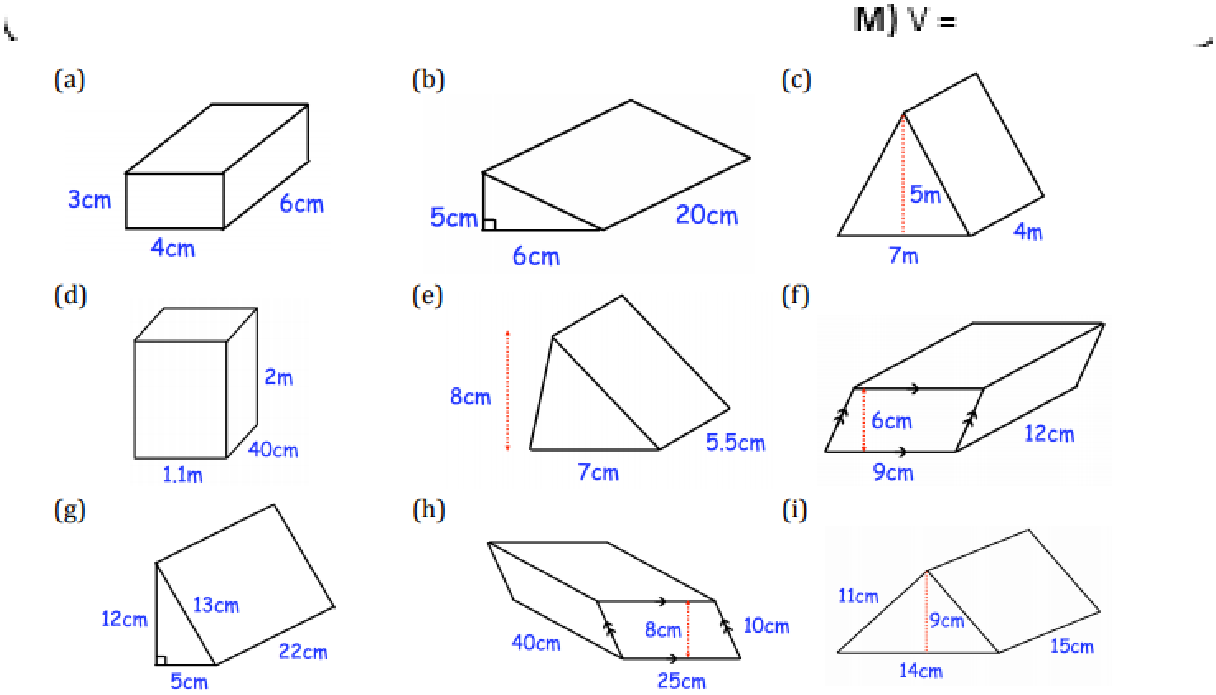
K) V =



L) V =

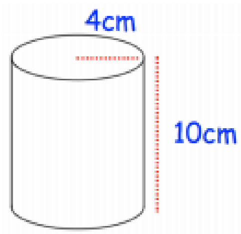


M) V =

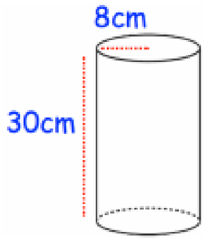


Question 1: Work out the volume of each cylinder.
Give each answer to one decimal place.

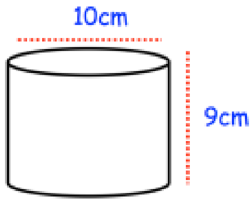
(a)



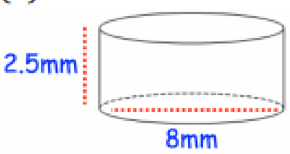
(b)



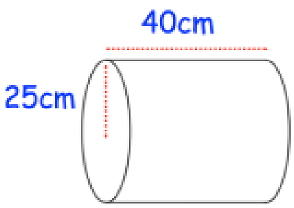
(c)



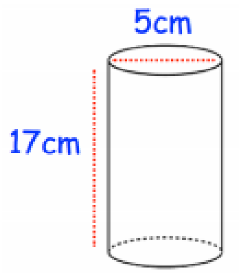
(d)



(e)



(f)



Exam Practice:

https://www.mathsgenie.co.uk/resources/4-volume-of-a-prism.pdf
https://www.mathsgenie.co.uk/resources/73_volume-and-surface-area-of-cylinder-ws.pdf

Stewards Academy

Week 7: Volume

- **LI: Know the formula for calculating the volume of a cone, sphere and pyramid and apply this knowledge to solve problems**

Demonstration Videos:

https://corbettmaths.com/2013/03/03/volume-of-a-cone/

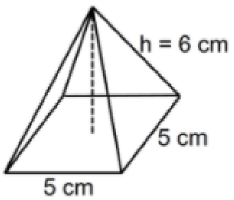
https://corbettmaths.com/2013/03/05/volume-of-a-pyramid/

https://corbettmaths.com/2013/03/03/volume-of-a-sphere/

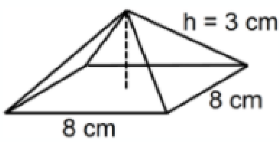
Tasks:

Calculate the volume

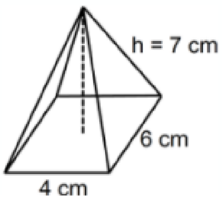
1)



2)

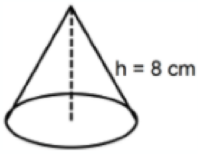


3)

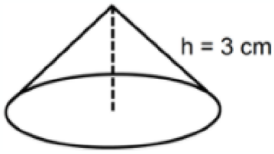


Calculate the volume

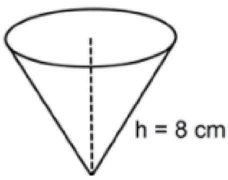
1) Radius = 5 cm



2) Radius = 3.5 cm

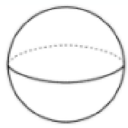


3) Diameter = 8 cm

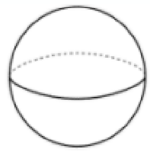


Calculate the volume of the spheres

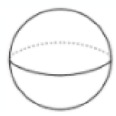
1) Radius = 5 cm



2) Diameter = 18 cm



3) Radius = 0.5 cm



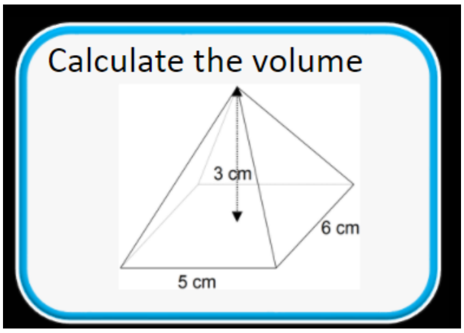
Name

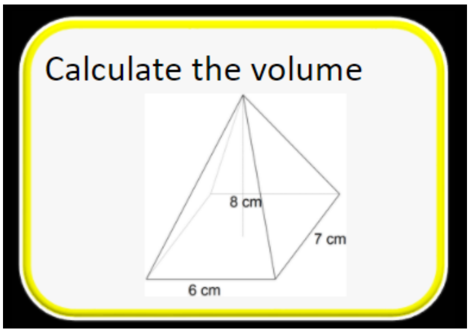
Volume of spheres and cones (r = radius d = diameter h = height) Answer correct to 1 d.p in cm ^{3}

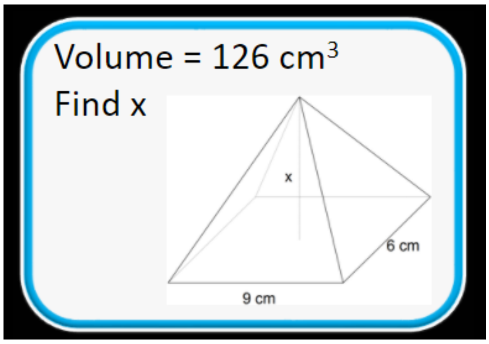
16.5	14.1	148.4	523.6	117.3
120.6	14.4	72.6	463.2	34.4
268.1	114.4	94.4	623.6	24.4
339.3	183.3	54.4	253.4	57.9
33.5	89.8	4.2	235.3	904.8

Sphere: r = 5.3 cm	Sphere: r = 2.4 cm	Sphere: r = 4 cm	Cone : d = 7 cm h = 7 cm
Cone : r = 6 cm h = 9 cm	Cone : r = 5 cm h = 7 cm	Sphere: r = 5 cm	Cone : d = 11 cm h = 8 cm
Cone : r = 4.8 cm h = 5 cm	Sphere: r = 4.8 cm	Cone : d = 9 cm h = 7 cm	Cone : d = 3 cm h = 7 cm
Sphere: r = 2 cm	Sphere: d = 3 cm	Sphere: r = 6 cm	Sphere: r = 1 cm
Cone : d = 6.8 cm h = 6 cm	Cone : r = 5.3 cm h = 8 cm	Sphere: r = 1.8 cm	Cone : r = 4 cm h = 7 cm

MISSING VOLUME



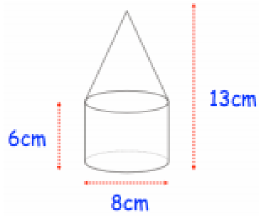




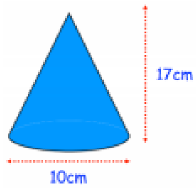
Challenges:

Apply

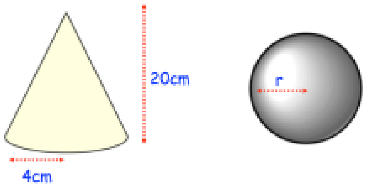
Question 1: A solid is formed from a cylinder and a cone.
Find the volume of the solid.



Question 2: A solid cone is made from a material which has a density of 8.7 g/cm^3.
The dimensions of the cone are shown below.
Find the mass of the cone.

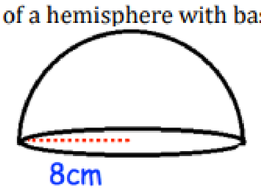


Question 3: The sphere and cone have an equal volume.
Find the radius of the sphere.



Question 1: A metal cuboid measuring 4cm by 5cm by 12cm is melted down and a sphere is made.
Calculate the radius of the sphere.

Question 2: Calculate the volume of a hemisphere with base of radius 8cm.



Question 3: A solid sphere fits perfectly inside of a cube box of side length 10cm.
What percentage of the box is empty?

Question 4: A ball of gold has a radius of 9cm.
The density of gold is 19.3g/cm^3.
Work out the mass of the ball.

Assessment Ladder