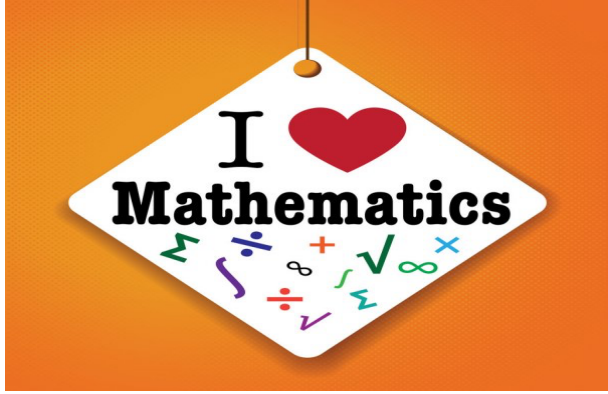
Year 6 Summer Term
Week 9
(w/c 22nd June)

Lesson 1
Area and perimeter
https://vimeo.com/430339457
Lesson 2
Area of triangles
https://vimeo.com/430339609
Lesson 3
Area of parallelograms
https://vimeo.com/430339748
Lesson 4
Volume of cuboids
https://vimeo.com/430339843
Lesson 5
Challenge



Lesson 1

Area and perimeter

https://vimeo.com/430339457

Answer questions on next few slides.

Area and perimeter

1 Use the words to complete the sentences.

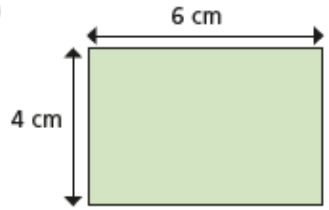
perimeter	cm²	cm	m
area	m²	inside	around

_____ is the amount of space _____ a two-dimensional shape. It can be measured in units such as _____ or _____

_____ is the distance _____ a two-dimensional shape. It can be measured in units such as _____ or _____

2 Work out the areas and perimeters of the shapes.

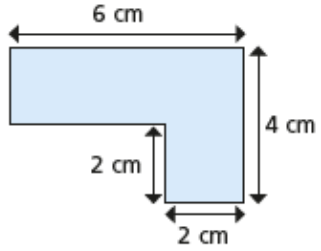
a)



perimeter = ☐ cm

area = ☐ cm²

b)

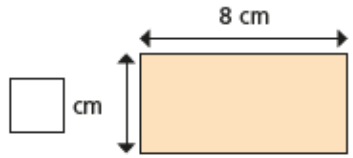


perimeter = ☐ cm

area = ☐ cm²

3 Work out the missing values.

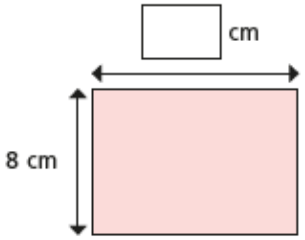
a)



area = 32 cm²

perimeter = ☐ cm

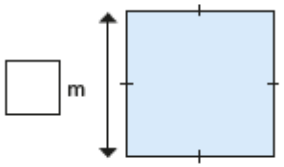
b)



area = ☐ cm²

perimeter = 40 cm

c)

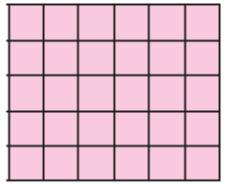


area = ☐ m²

perimeter = 36 m

4 Work out the areas and perimeters of the shapes.

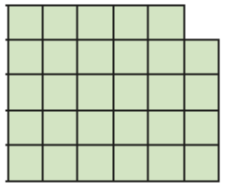
Shape A



area = ☐ cm²

perimeter = ☐ cm

Shape B



area = ☐ cm²

perimeter = ☐ cm

What do you notice?

Area and perimeter

1 Use the words to complete the sentences.

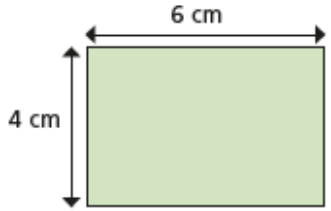
perimeter	cm²	cm	m
area	m²	inside	around

Area is the amount of space inside a two-dimensional shape. It can be measured in units such as cm² or m².

Perimeter is the distance around a two-dimensional shape. It can be measured in units such as cm or m.

2 Work out the areas and perimeters of the shapes.

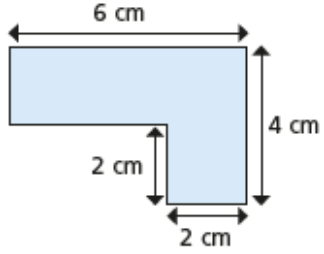
a)



perimeter = 20 cm

area = 24 cm²

b)

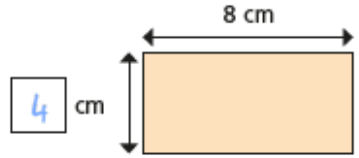


perimeter = 20 cm

area = 16 cm²

3 Work out the missing values.

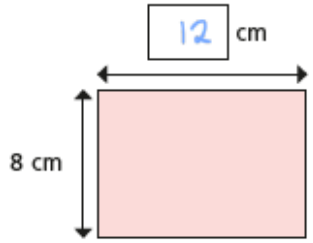
a)



area = 32 cm²

perimeter = 24 cm

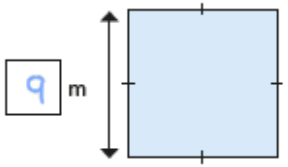
b)



area = 96 cm²

perimeter = 40 cm

c)

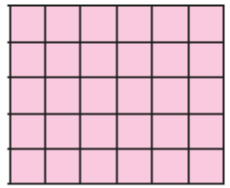


area = 81 m²

perimeter = 36 m

4 Work out the areas and perimeters of the shapes.

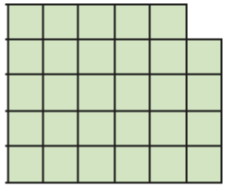
Shape A



area = 30 cm²

perimeter = 22 cm

Shape B



area = 29 cm²

perimeter = 28 cm

What do you notice?

5

Tommy

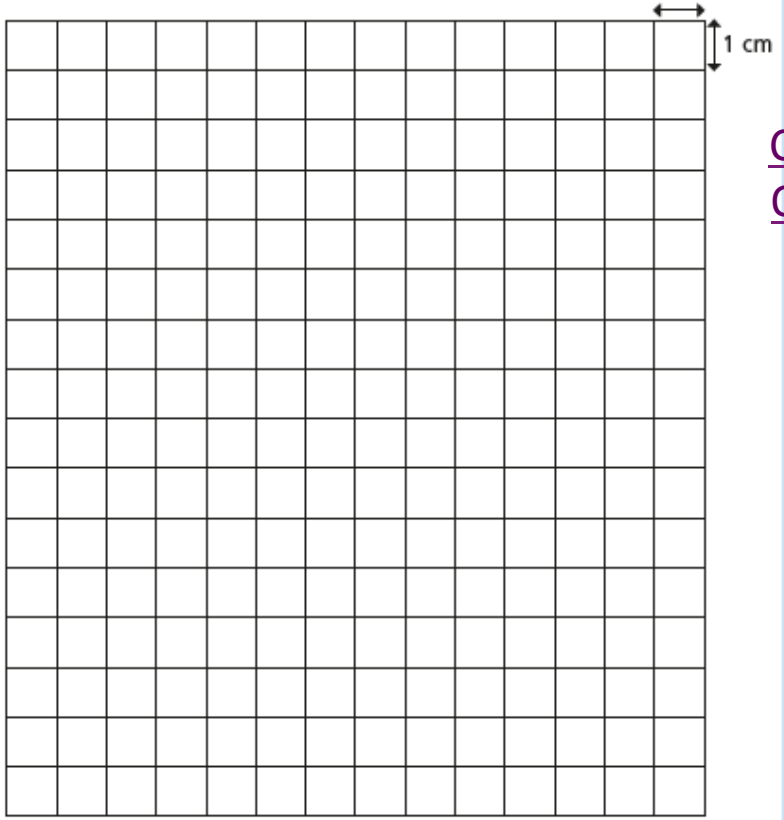
If you start with a rectilinear shape, when you increase the area, the perimeter will increase.

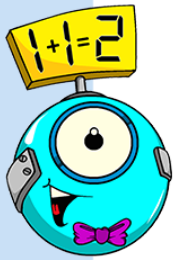
Amir

It depends on the shape.

Who do you agree with? _____

Draw some examples to support your answer.



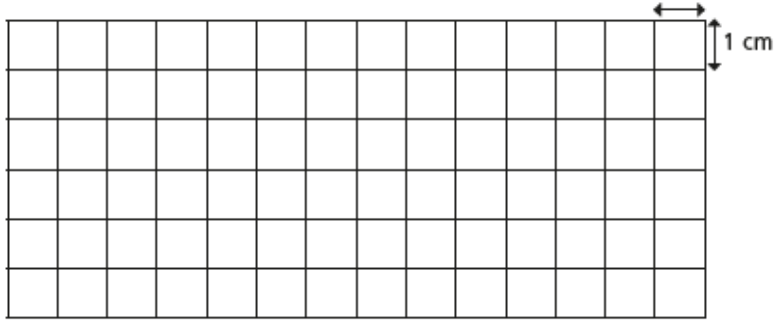


CHALLENGE QUESTIONS

6 Two rectilinear shapes, A and B, each have an area of 12 squares.

- Shape A has the largest perimeter possible.
- Shape B has the smallest perimeter possible.

Draw shapes A and B.



What do you notice?

7 Mr Jones has 50 m of fencing.

He wants to make a rectilinear enclosure using all the fencing.

a) Draw an example of a shape he could make. Give units on your diagram.

b) What is the greatest possible area of the enclosure? ☐

c) What is the smallest possible area of the enclosure? ☐

5

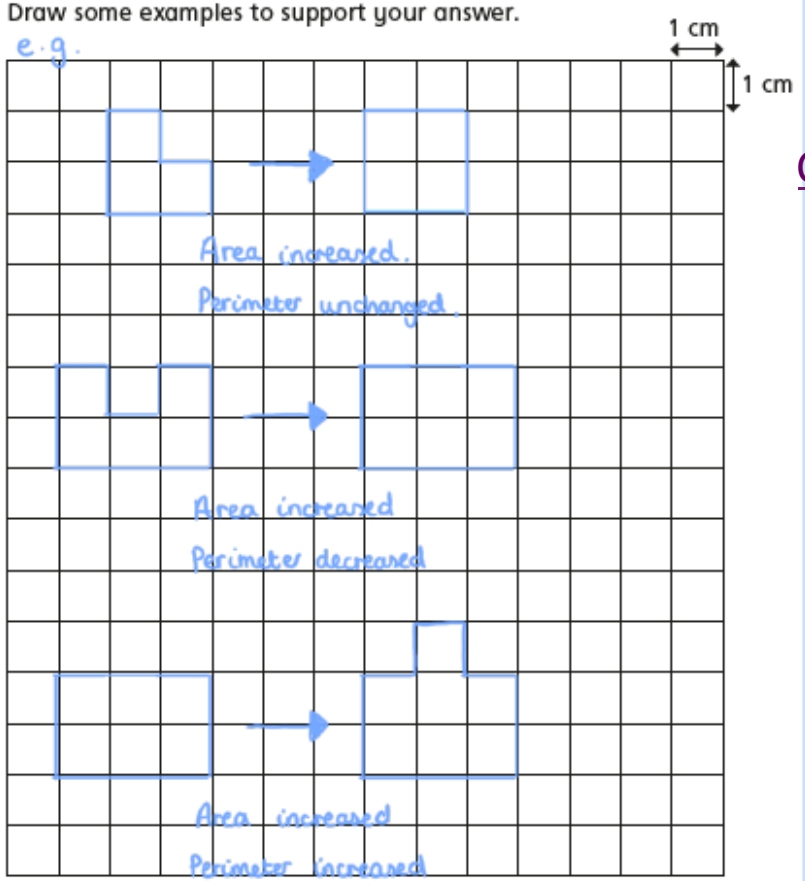
Tommy: If you start with a rectilinear shape, when you increase the area, the perimeter will increase.

Amir: It depends on the shape.

Who do you agree with? Amir

Draw some examples to support your answer.

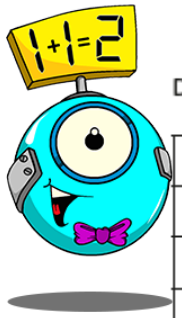
e.g.



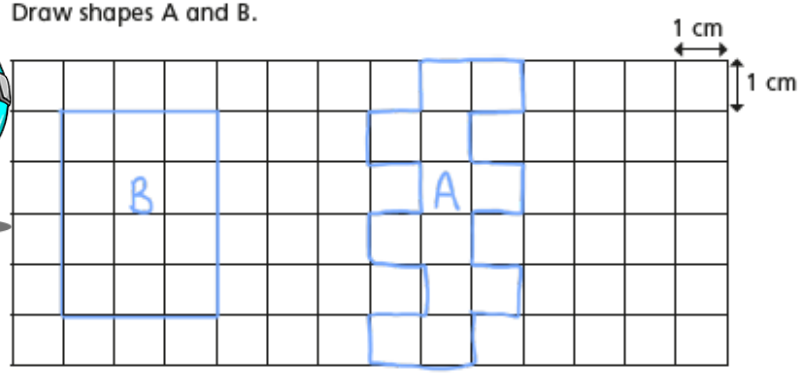
CHALLENGE ANSWERS

6 Two rectilinear shapes, A and B, each have an area of 12 squares.

- Shape A has the largest perimeter possible.
- Shape B has the smallest perimeter possible.



Draw shapes A and B.

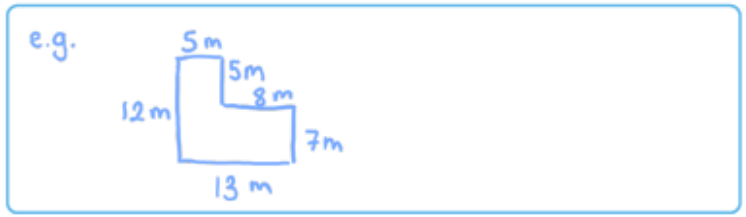


What do you notice?

7 Mr Jones has 50 m of fencing.

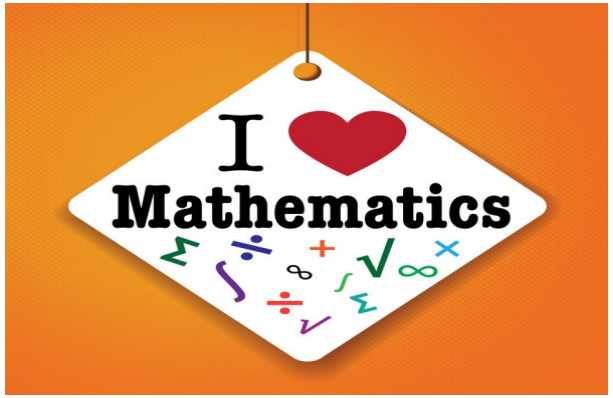
He wants to make a rectilinear enclosure using all the fencing.

a) Draw an example of a shape he could make. Give units on your diagram.



b) What is the greatest possible area of the enclosure? 156 m^2

c) What is the smallest possible area of the enclosure? 24 m^2



Lesson 2

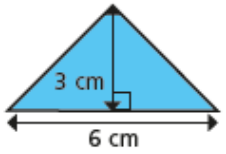
Area of triangles

https://vimeo.com/430339609

Answer questions on next few slides.

Area of a triangle (3)

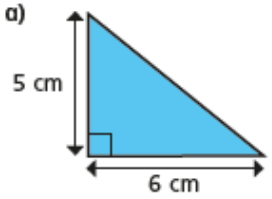
1 Calculate the area of the triangle.



area = ☐ cm²

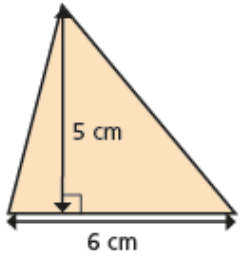
2 Calculate the area of the triangles.

a)



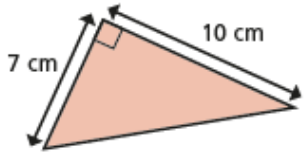
area = ☐ cm²

c)



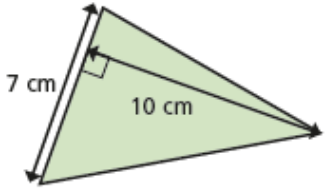
area = ☐ cm²

b)



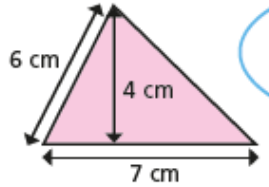
area = ☐ cm²

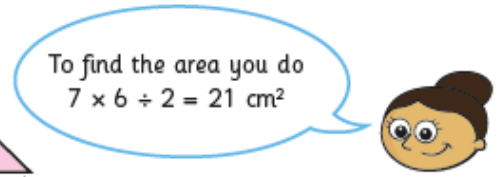
d)



area = ☐ cm²

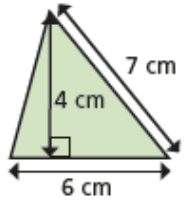
3 What mistake has Dora made?

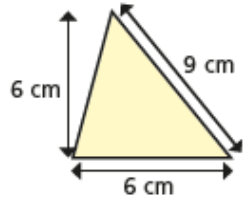


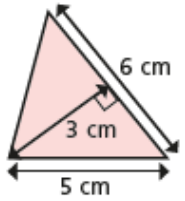


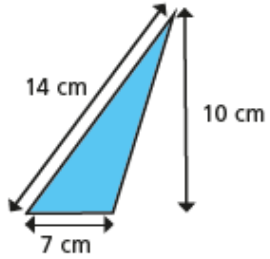
4 Label the base of each triangle b.

Label the perpendicular height h.







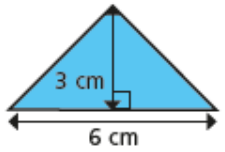


5 Are the statements always, sometimes or never true?

The side at the bottom of a triangle is the base.	The perpendicular height is equal to the vertical height.
_____	_____

Area of a triangle (3)

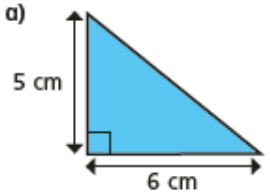
1 Calculate the area of the triangle.



area = 9 cm²

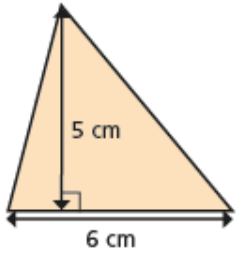
2 Calculate the area of the triangles.

a)



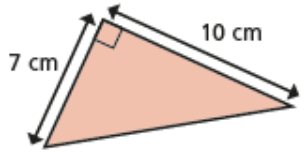
area = 15 cm²

c)



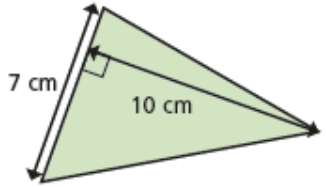
area = 15 cm²

b)



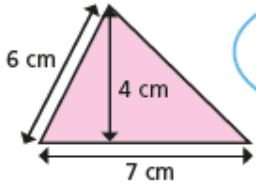
area = 35 cm²

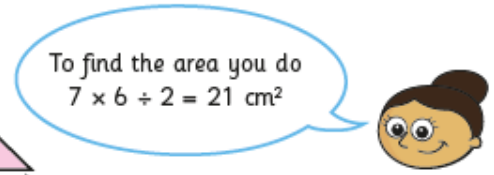
d)



area = 35 cm²

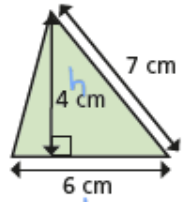
3 What mistake has Dora made?

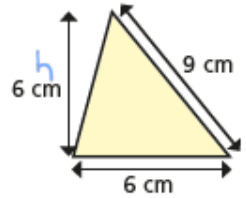


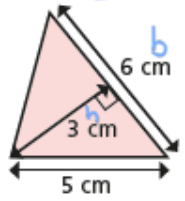


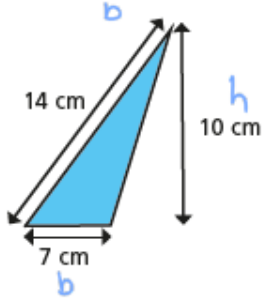
4 Label the base of each triangle b.

Label the perpendicular height h.







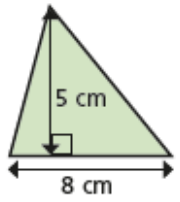


5 Are the statements always, sometimes or never true?

The side at the bottom of a triangle is the base.	The perpendicular height is equal to the vertical height.
Sometimes	sometimes

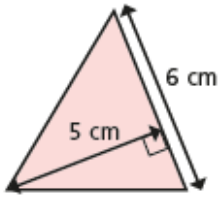
6 Calculate the area of the triangles.

a)



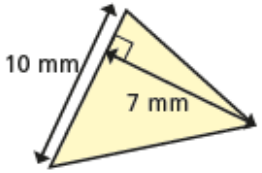
area = ☐ cm²

b)



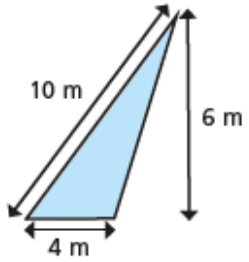
area = ☐ cm²

c)



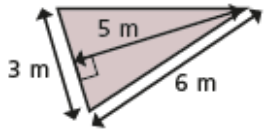
area = ☐ mm²

d)



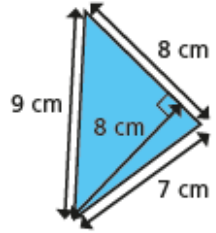
area = ☐ m²

e)

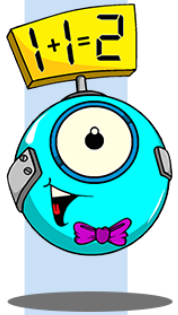


area = ☐ m²

f)

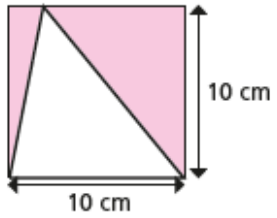


area = ☐ cm²



CHALLENGE QUESTIONS

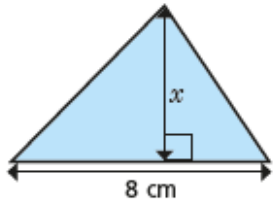
7 Find the area of the shaded region.



area = ☐ cm²

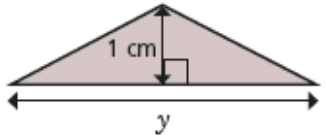
8 The area of each triangle is 12 cm². Find the missing lengths.

a)



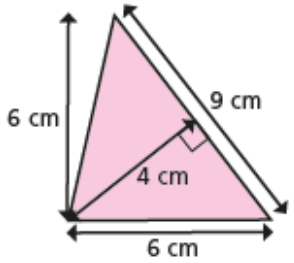
x = ☐ cm

b)



y = ☐ cm

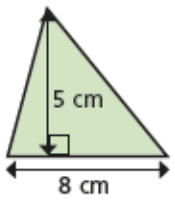
9 Show two ways you can work out the area of the triangle.



Compare answers with a partner.

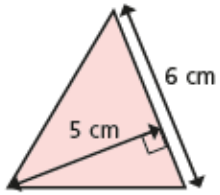
6 Calculate the area of the triangles.

a)



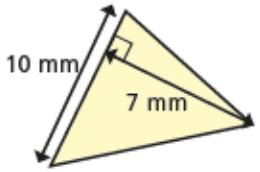
area = 20 cm²

b)



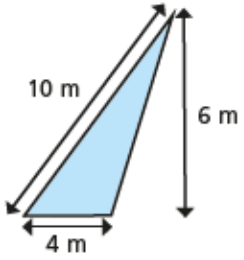
area = 15 cm²

c)



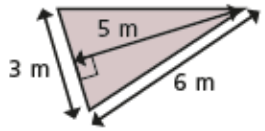
area = 35 mm²

d)



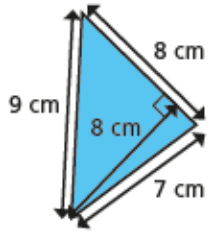
area = 12 m²

e)

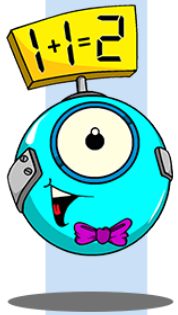


area = 7.5 m²

f)

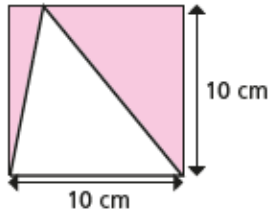


area = 32 cm²



CHALLENGE ANSWERS

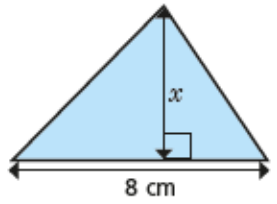
7 Find the area of the shaded region.



area = 50 cm²

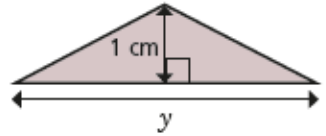
8 The area of each triangle is 12 cm². Find the missing lengths.

a)



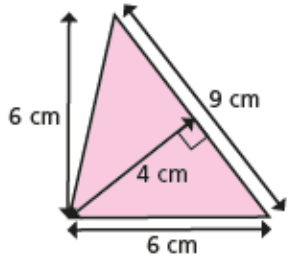
x = 3 cm

b)



y = 24 cm

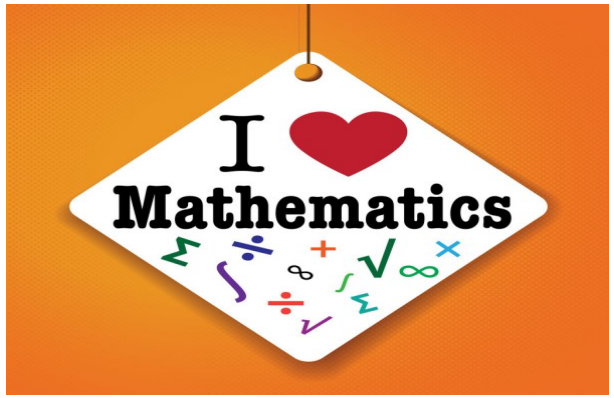
9 Show two ways you can work out the area of the triangle.



$\frac{9 \times 4}{2} = 18\text{cm}^2$

$\frac{6 \times 6}{2} = 18\text{cm}^2$

Compare answers with a partner.



Lesson 3

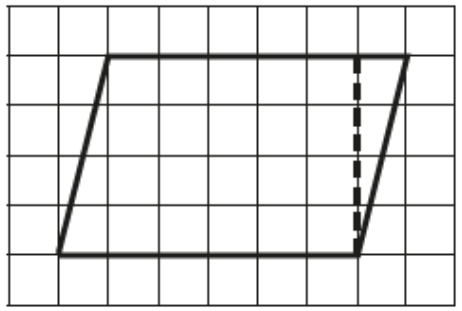
Area of parallelograms

https://vimeo.com/430339748

Answer questions on next few slides.

Area of a parallelogram

1 On a piece of squared paper, copy this parallelogram and cut it out.



a) Create a rectangle by cutting off the right-angled triangle and moving it.

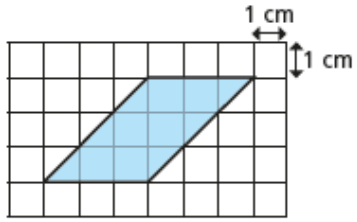
b) Complete the sentences.

The area of the rectangle is ☐ squares.

The area of the parallelogram is ☐ squares.

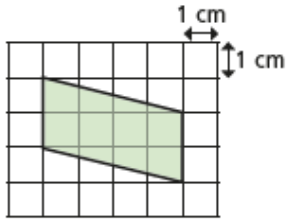
2 Calculate the areas of the parallelograms.

a)



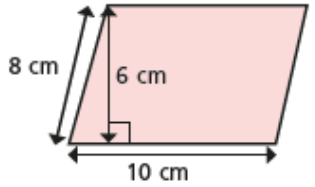
area = ☐ cm²

b)



area = ☐ cm²

3 Huan is finding the area of the parallelogram.



$10 \times 8 = 80$ cm²

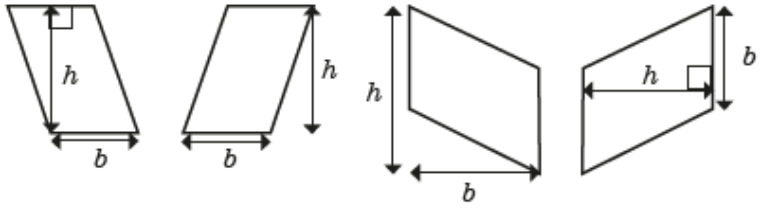
a) What mistake has Huan made?

b) What is the correct answer?

area = ☐ cm²

4 Esther has labelled the bases and heights for four parallelograms.

Three are correct; one is incorrect. Tick the shapes that have been correctly labelled.

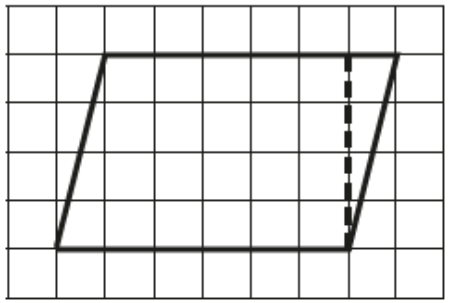


☐ ☐ ☐ ☐

Explain to a partner why one is incorrect.

Area of a parallelogram

1 On a piece of squared paper, copy this parallelogram and cut it out.



a) Create a rectangle by cutting off the right-angled triangle and moving it.

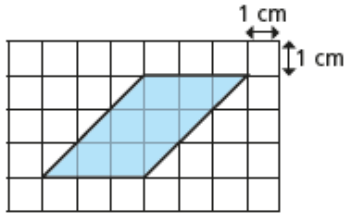
b) Complete the sentences.

The area of the rectangle is [24] squares.

The area of the parallelogram is [24] squares.

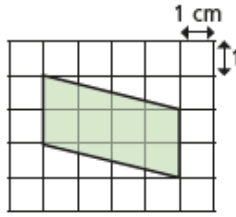
2 Calculate the areas of the parallelograms.

a)



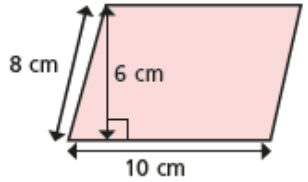
area = [9] cm²

b)



area = [8] cm²

3 Huan is finding the area of the parallelogram.



$10 \times 8 = 80$ cm²

a) What mistake has Huan made?

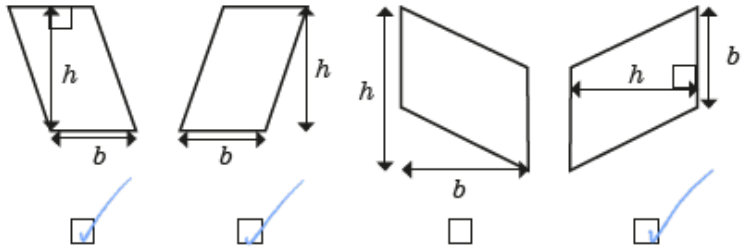
He hasn't used the perpendicular height.

b) What is the correct answer?

area = [60] cm²

4 Esther has labelled the bases and heights for four parallelograms.

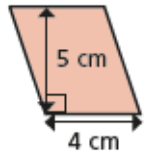
Three are correct; one is incorrect. Tick the shapes that have been correctly labelled.



Explain to a partner why one is incorrect.

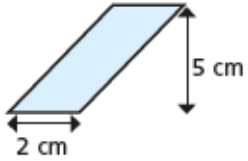
5 Calculate the areas of the parallelograms.

a)



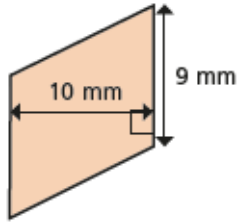
area = ☐ cm²

b)



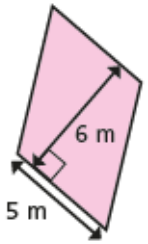
area = ☐ cm²

c)



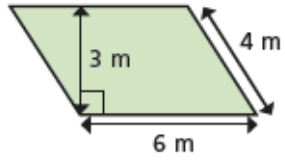
area = ☐ mm²

d)



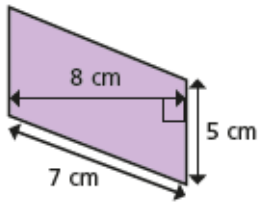
area = ☐ m²

e)

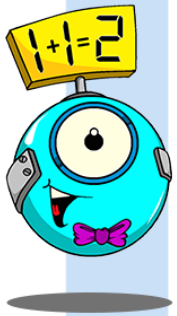


area = ☐ m²

f)



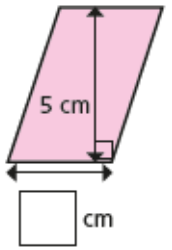
area = ☐ cm²



CHALLENGE QUESTIONS

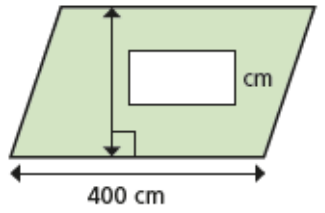
6 Find the missing lengths.

a)



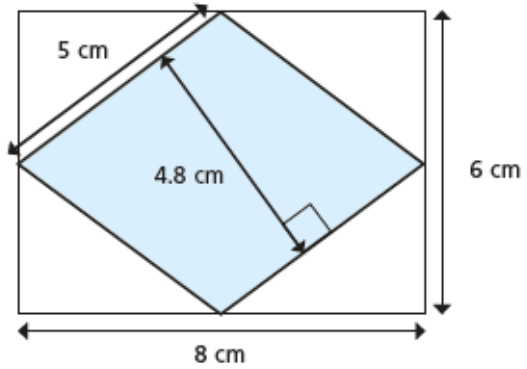
area = 15 cm²

b)



area = 12 m²

7 Here is a rhombus inside a rectangle.



a) Calculate the area of the rhombus.

area = ☐ cm²

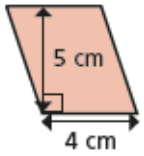
b)

The area of the rhombus is half the area of the rectangle. This means that it is a special triangle.

Explain to a partner why Mo is wrong.

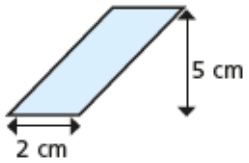
5 Calculate the areas of the parallelograms.

a)



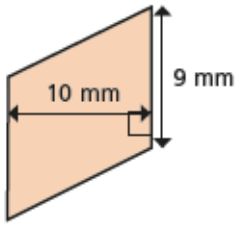
area = 20 cm²

b)



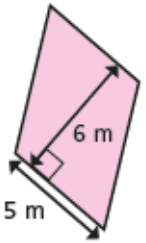
area = 10 cm²

c)



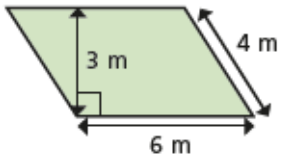
area = 90 mm²

d)



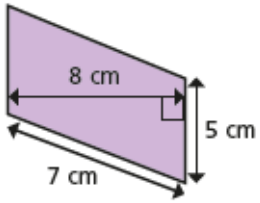
area = 30 m²

e)

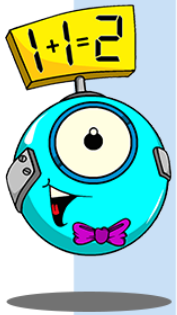


area = 18 m²

f)



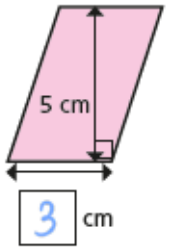
area = 40 cm²



CHALLENGE ANSWERS

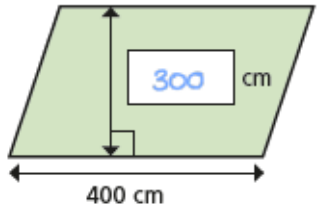
6 Find the missing lengths.

a)



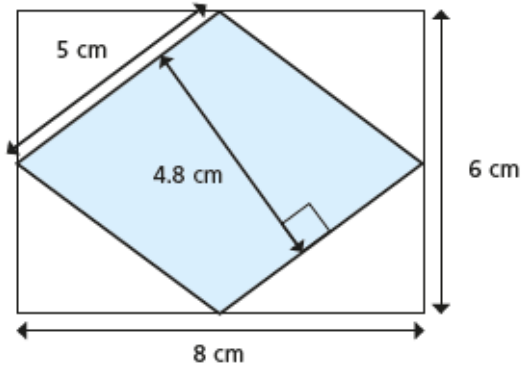
area = 15 cm²

b)



area = 12 m²

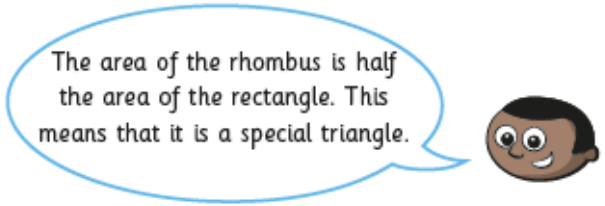
7 Here is a rhombus inside a rectangle.



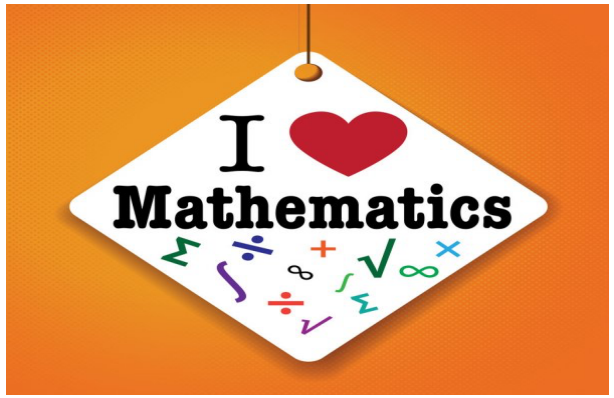
a) Calculate the area of the rhombus.

area = 24 cm²

b)



Explain to a partner why Mo is wrong.



Lesson 4

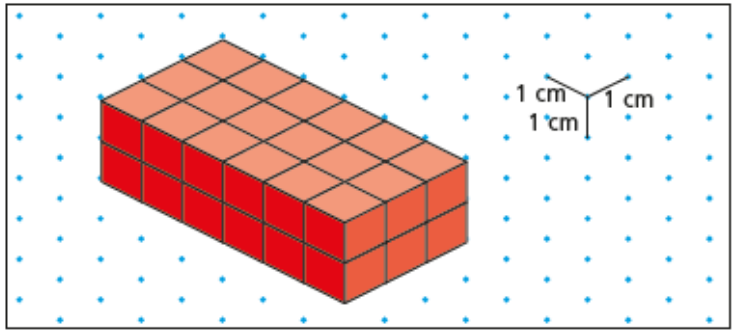
Volume of cuboids

https://vimeo.com/430339843

Answer questions on next few slides

Volume of a cuboid

1 Here is a cuboid made up of cubes.

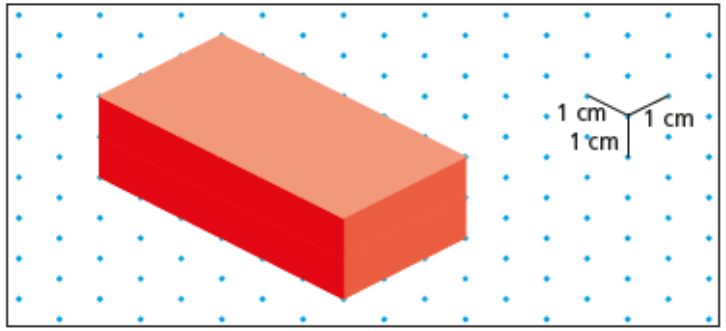


a) What is the volume of the cuboid?

volume = ☐ cm³

b) Explain your method for finding the volume.

c) What is the volume of this cuboid?



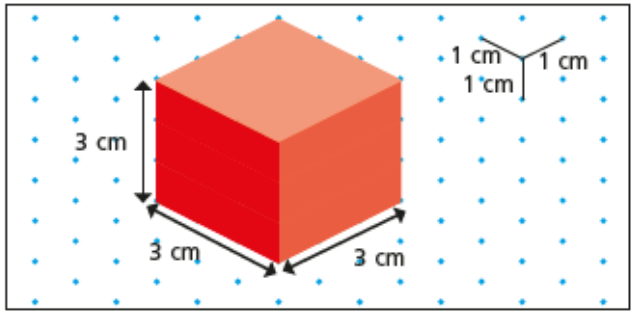
volume = ☐ cm³

d) What is the same and what is different about the cuboids?

2 Find the volume of the cuboids.

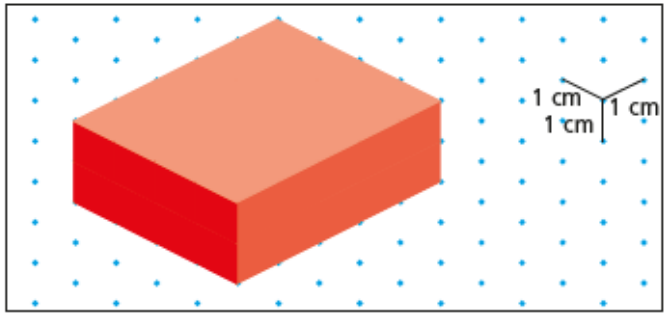
You can make them with cubes if it helps.

a)



volume = ☐ cm³

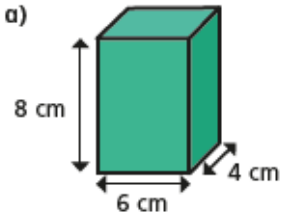
b)



volume = ☐ cm³

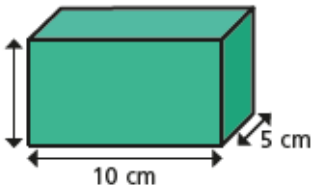
3 Calculate the volumes of the cuboids.

a)



volume = ☐ cm³

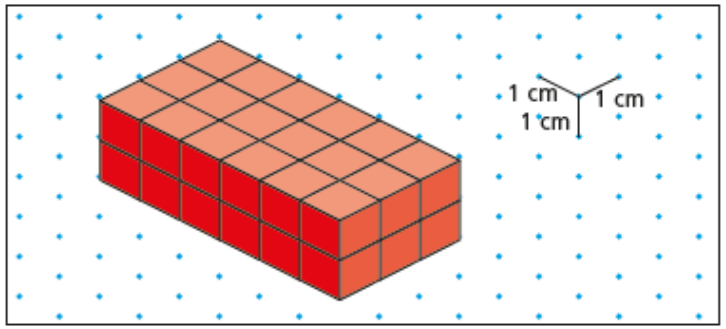
b)



volume = ☐ cm³

Volume of a cuboid

1 Here is a cuboid made up of cubes.

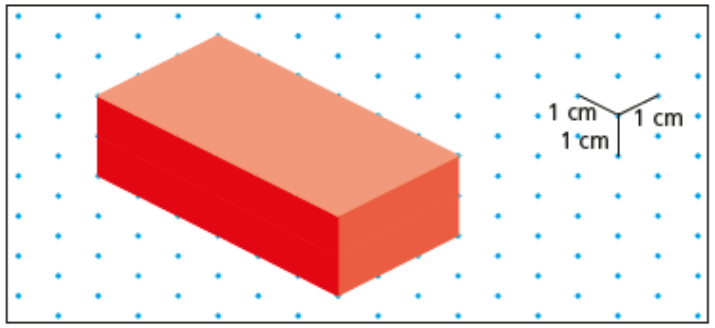


a) What is the volume of the cuboid?

volume = 36 cm³

b) Explain your method for finding the volume.

c) What is the volume of this cuboid?



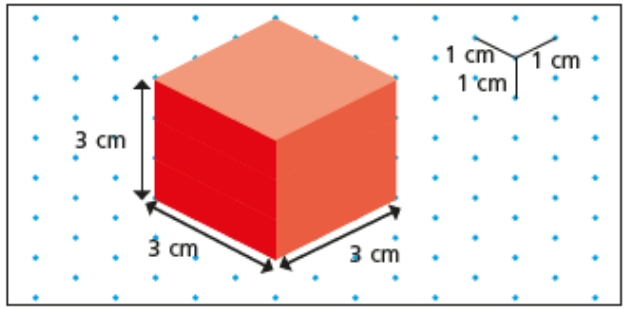
volume = 36 cm³

d) What is the same and what is different about the cuboids?

2 Find the volume of the cuboids.

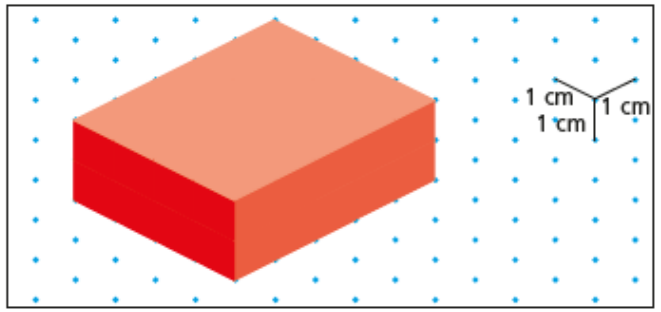
You can make them with cubes if it helps.

a)



volume = 27 cm³

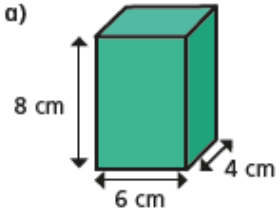
b)



volume = 40 cm³

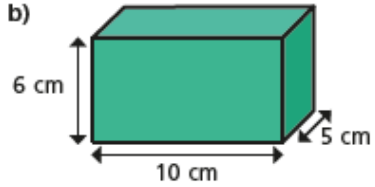
3 Calculate the volumes of the cuboids.

a)



volume = 192 cm³

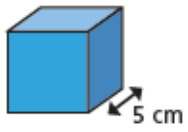
b)



volume = 300 cm³

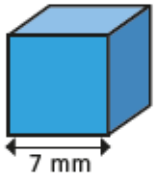
4 Calculate the volumes of the cubes.

a)

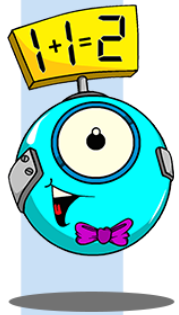


volume = ☐ cm³

b)

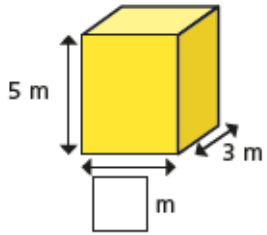


volume = ☐ mm³

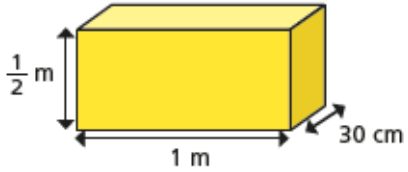


5 The volume of the cuboid is 60 m³

Find the missing length.

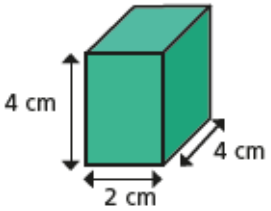


6 Calculate the volume of the cuboid.

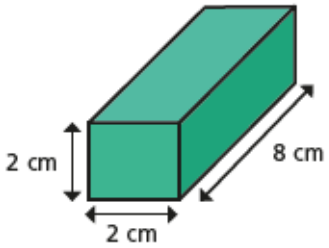


volume = ☐ cm³

7 a) Calculate the volumes of the two cuboids.



☐ cm³



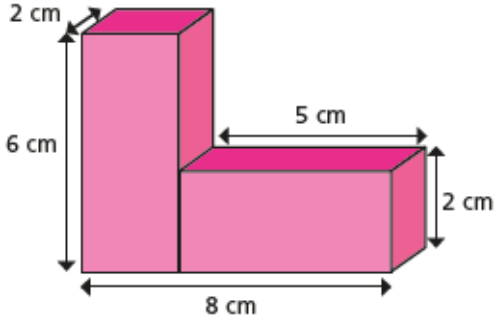
☐ cm³

What do you notice?

CHALLENGE QUESTIONS

b) Draw two different cuboids that have a volume of 24 cm³

8 Calculate the total volume of the shape.

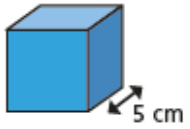


volume = ☐ cm³

Was there another method you could have used?

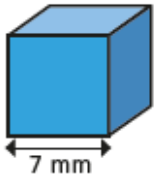
4 Calculate the volumes of the cubes.

a)



volume = 125 cm³

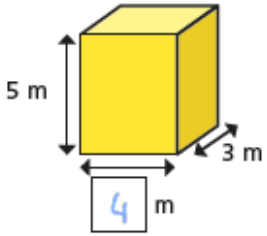
b)



volume = 343 mm³

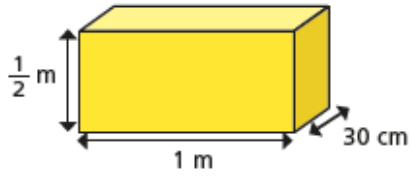
5 The volume of the cuboid is 60 m³

Find the missing length.



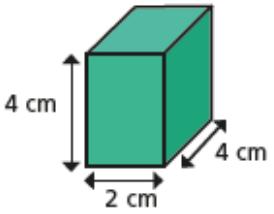
4 m

6 Calculate the volume of the cuboid.

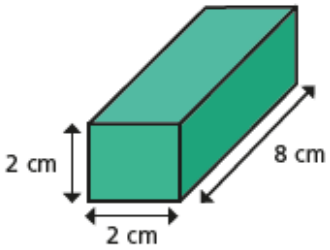


volume = 150,000 cm³

7 a) Calculate the volumes of the two cuboids.

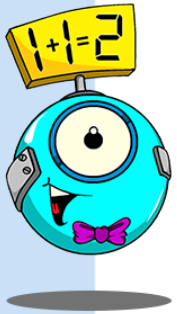


32 cm³



32 cm³

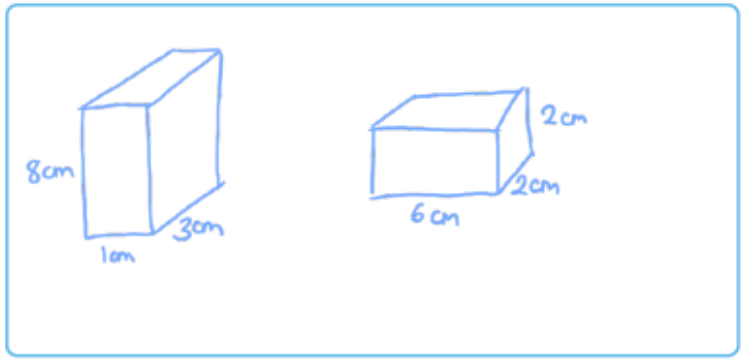
What do you notice?



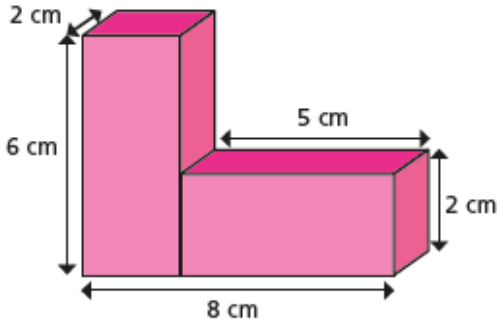
CHALLENGE ANSWERS

b) Draw two different cuboids that have a volume of 24 cm³

e.g.

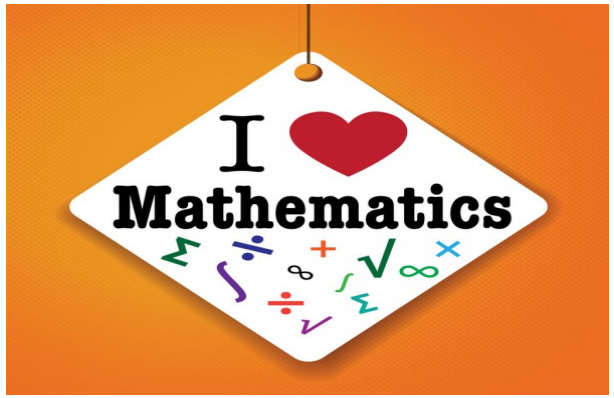


8 Calculate the total volume of the shape.

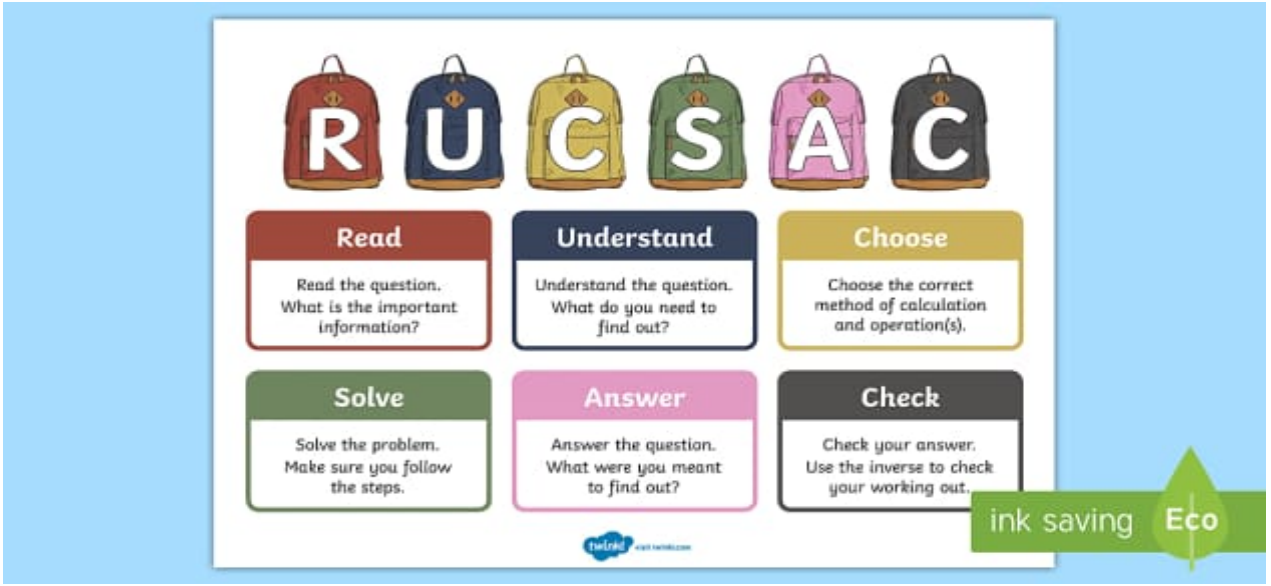


volume = 56 cm³

Was there another method you could have used?

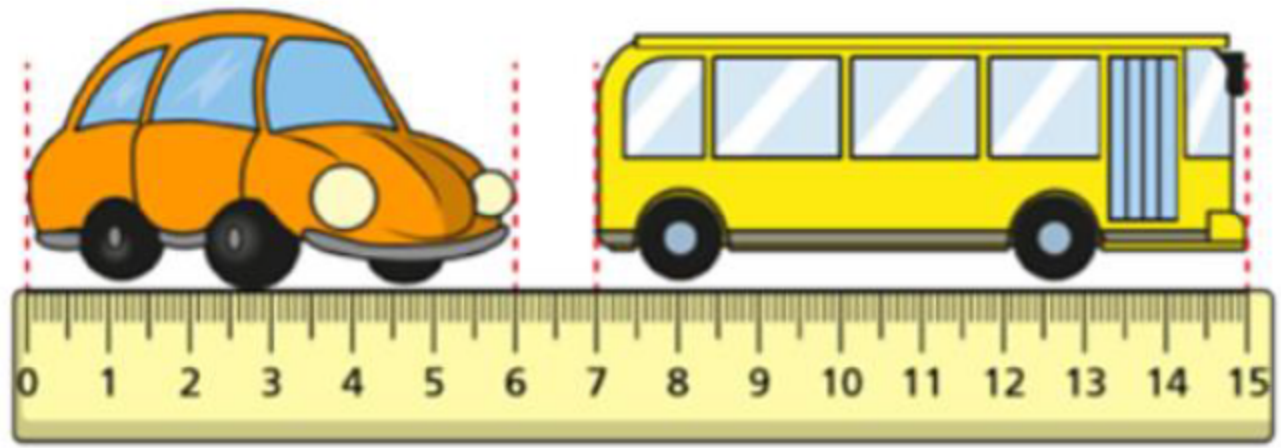


Lesson 5
Challenge
Attempt the following problems.
Remember to use RUCSAC



Challenge 1

Here is a toy car and bus.

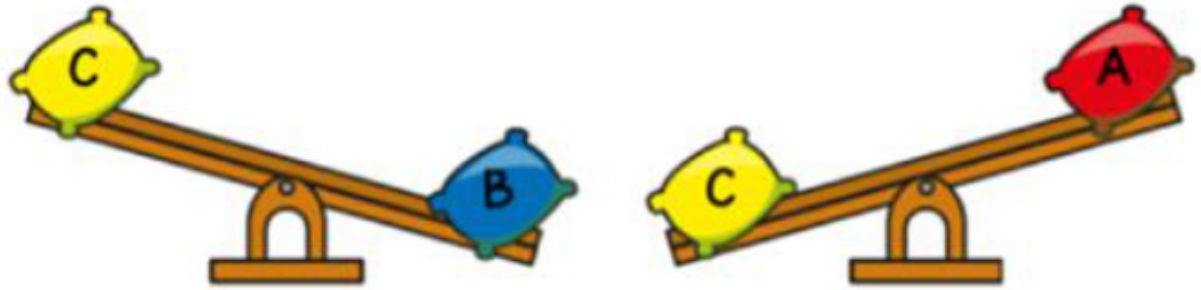


How much longer is the bus than the car?

Challenge 2

Here are 3 beanbags.

They are placed on a seesaw.

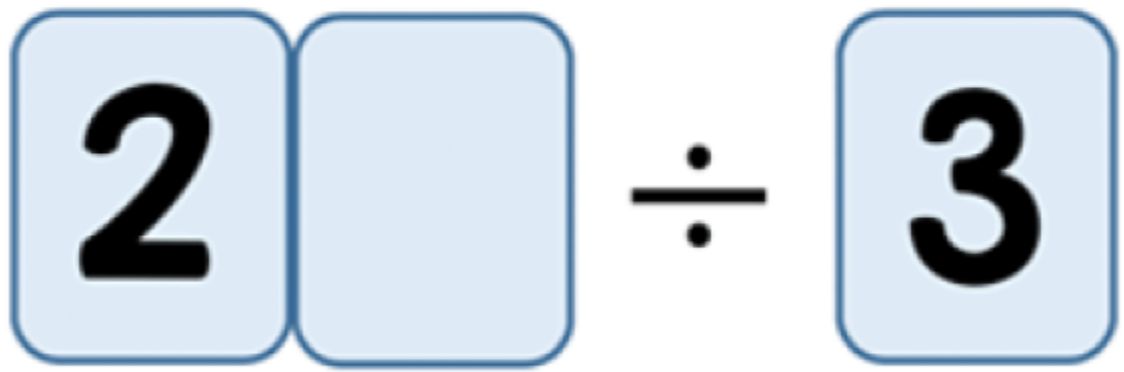


Which beanbag is the heaviest?

Challenge 3

Amir is dividing a 2-digit number by 3.

His answer is a whole number.



What could the missing digit be?

Challenge 4

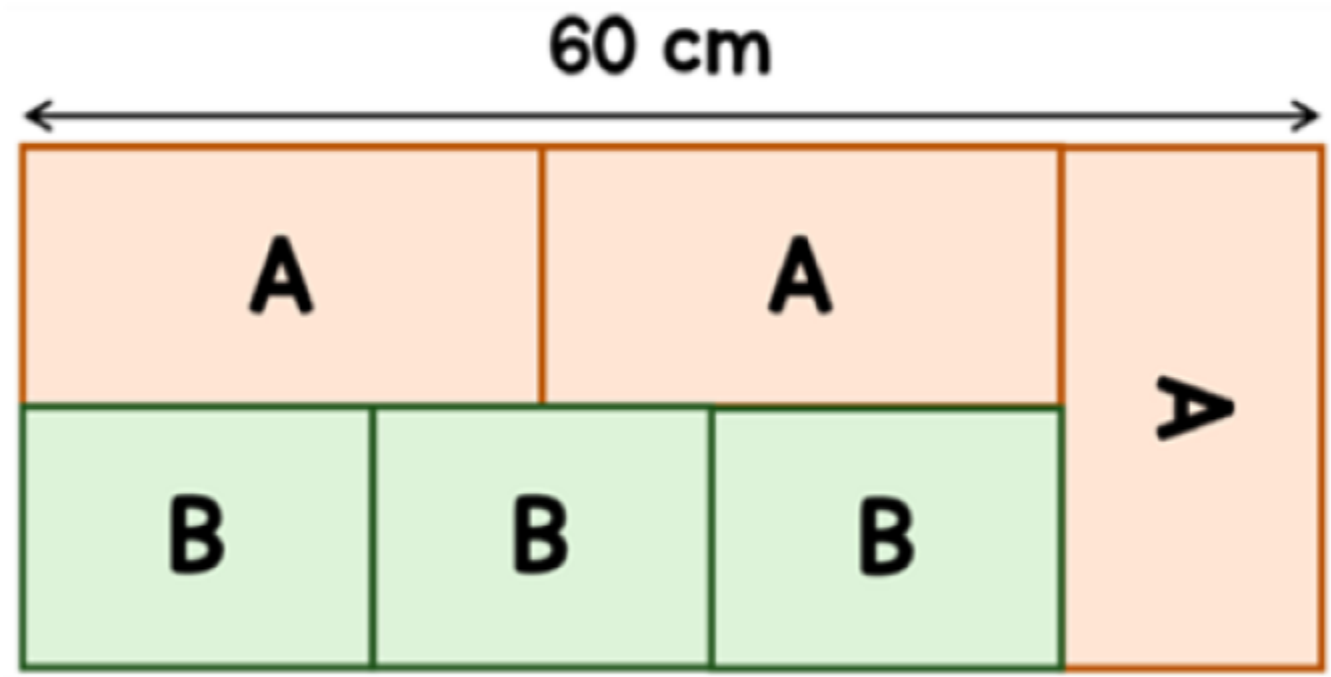
Lewis makes a repeating pattern with some shapes.

Lewis repeats the pattern.

What is the shape in the **50th** position?

Challenge 5

A large rectangle is made up of smaller rectangles, labelled A and B.

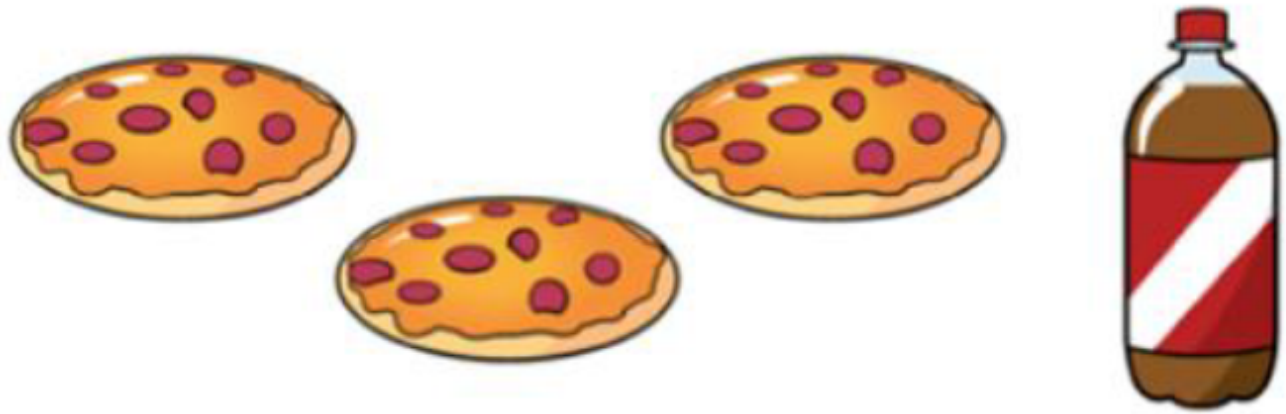


The length of A is double the width of A.

Find the area of one of the rectangles labelled B.

Challenge 6

Mina buys 3 pizzas and a bottle of cola.



A pizza costs £3.20 more than a bottle of cola.

The total cost of the items is £19.40

How much does a pizza cost?

Challenge 7

A barrel is half full with water.

12 litres of water are poured out.

The barrel is now $^{1}/_{5}$ full.

How much water does the barrel hold when full?

Challenge 8

Work out the following without a calculator.

$$\frac{10 + 20 + 40 + 80 + 160 + 320 + 640}{2 + 4 + 8 + 16 + 32 + 64 + 128}$$

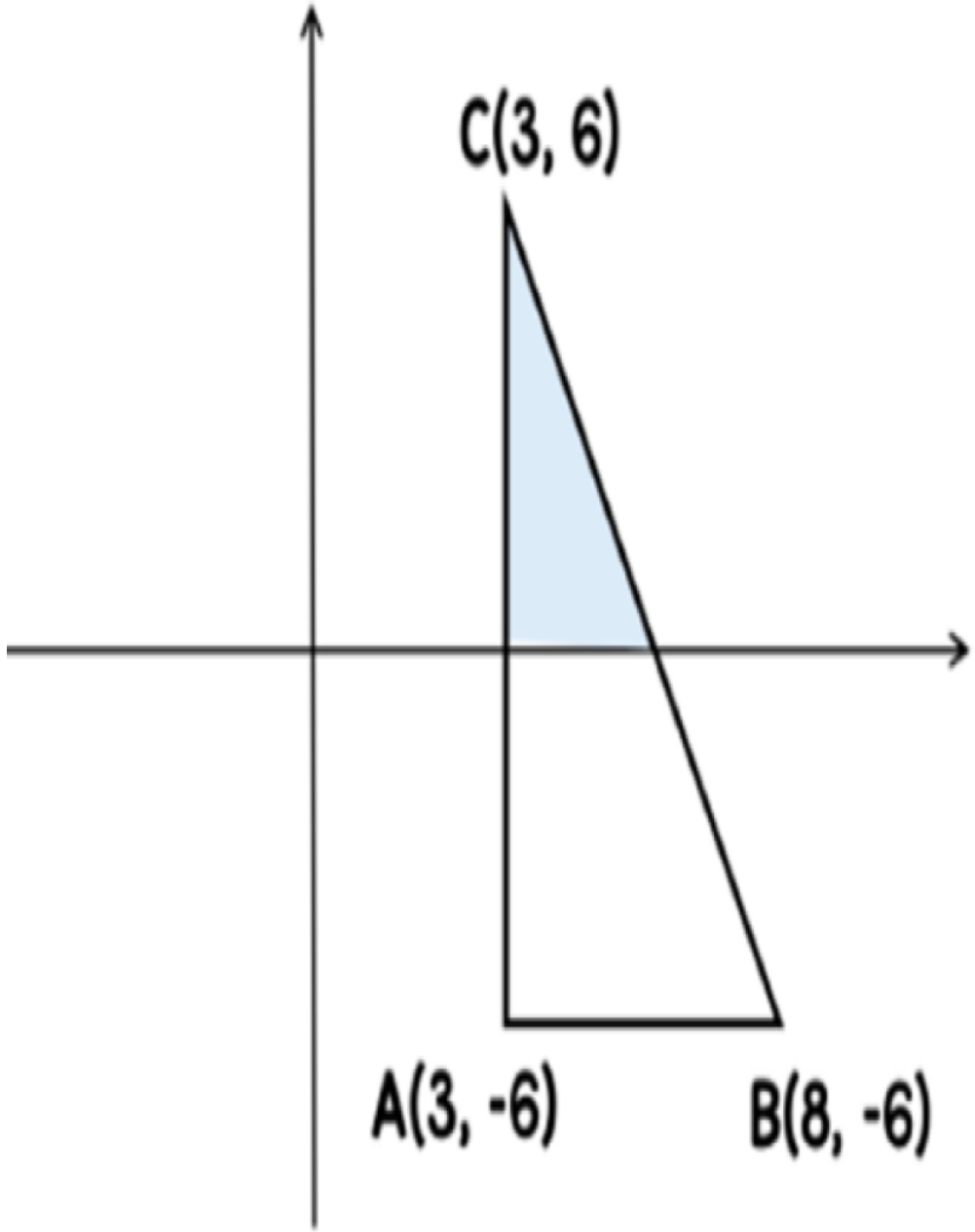
Explain your method.

Challenge 9

ABC is a right-angled triangle.

Part of the triangle has been shaded.

What fraction of the triangle is shaded?



Challenge 10

In a test Freya scores 25% more marks than Eva.

Eva scores 50% more marks than Dominic.

In total the three children score 140 marks.

The test is out of 80.

What percentage does Dominic score in the test?

Answers

Challenge 1 - 68p

Challenge 2 - 50

Challenge 3 - 34, 42, 50

Challenge 4 - 6/16 = 3/8

Challenge 5 - 890 g

Challenge 6 - 33

Challenge 7 - 690 people

Challenge 8 - 110 g

Challenge 9 - 14 cm

Challenge 10 - 300 adults