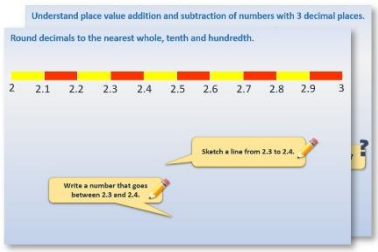
Week 11, Day 2
Ratio and scaling problems

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. Start by reading through the **Learning Reminders**.
They come from our *PowerPoint* slides.



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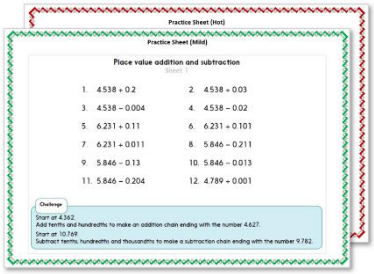
2. Tackle the questions on the **Practice Sheet**.
There might be a choice of either Mild (easier) or Hot (harder)!
Check the answers.



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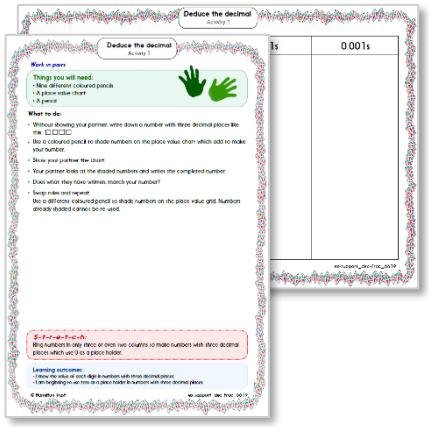
3. Finding it tricky? That's OK… have a go with a grown-up at **A Bit Stuck?**



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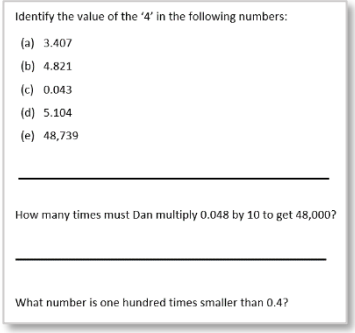
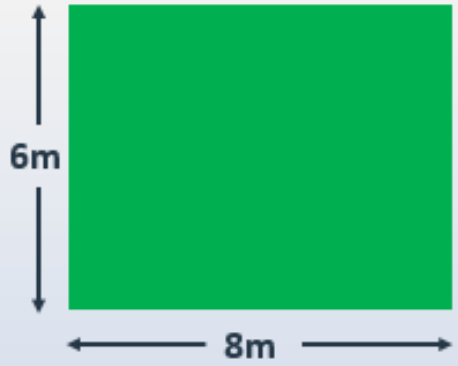
4. Have I mastered the topic? A few questions to **Check your understanding**.
Fold the page to hide the answers!



Learning Reminders

Solve problems involving similar shapes where the scale factor is known.



A garden designer is creating a scale drawing of a garden that is 6m by 8m. If the scale drawing is $^1/_{10}$ of the real measurements, what size rectangle should she draw?

0.6m by 0.8m or 60cm by 80cm

What if the scale drawing is $^1/_{20}$ of the life-size garden?

0.3m by 0.4m or 30cm by 40cm

A flower bed is 2m by 1.8metres. What size should this be on each of the scale drawings?

If the scale drawing is $^1/_{10}$

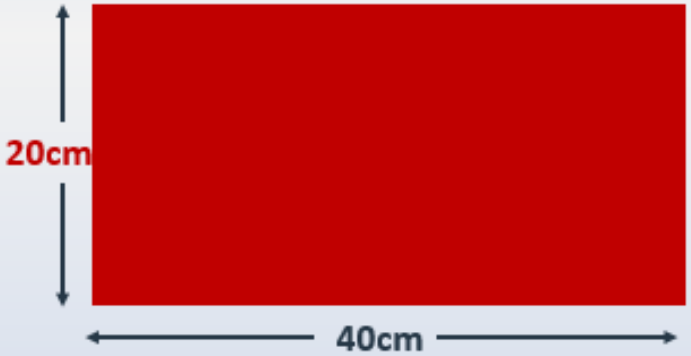
20cm by 18cm

If the scale drawing is $^1/_{20}$

10cm by 9cm

Learning Reminders

Solve ratio problems.



The ratio of the longer side to the shorter side of this rectangle is 2 to 1. What is the length of the shorter side?

What are the lengths of the other sides? 40cm and 20cm
How do you know?
Because opposite sides of a rectangle are the same length.

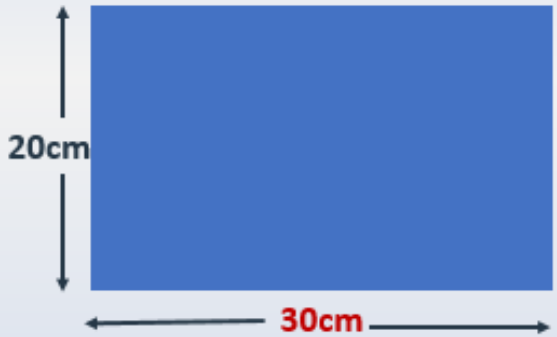
Draw a different rectangle such that the longer side is double the shorter side.

20cm by 10cm

30cm by 15cm

Learning Reminders

Solve ratio problems.



This time the longer side is $1\frac{1}{2}$ times that of the shorter side.
What is the length of the longer sides?

We could say that the ratio is $1\frac{1}{2}$ to 1, but we tend to use whole numbers in ratios, so we can say that the ratio of the longer side to the shorter side is 3 to 2.

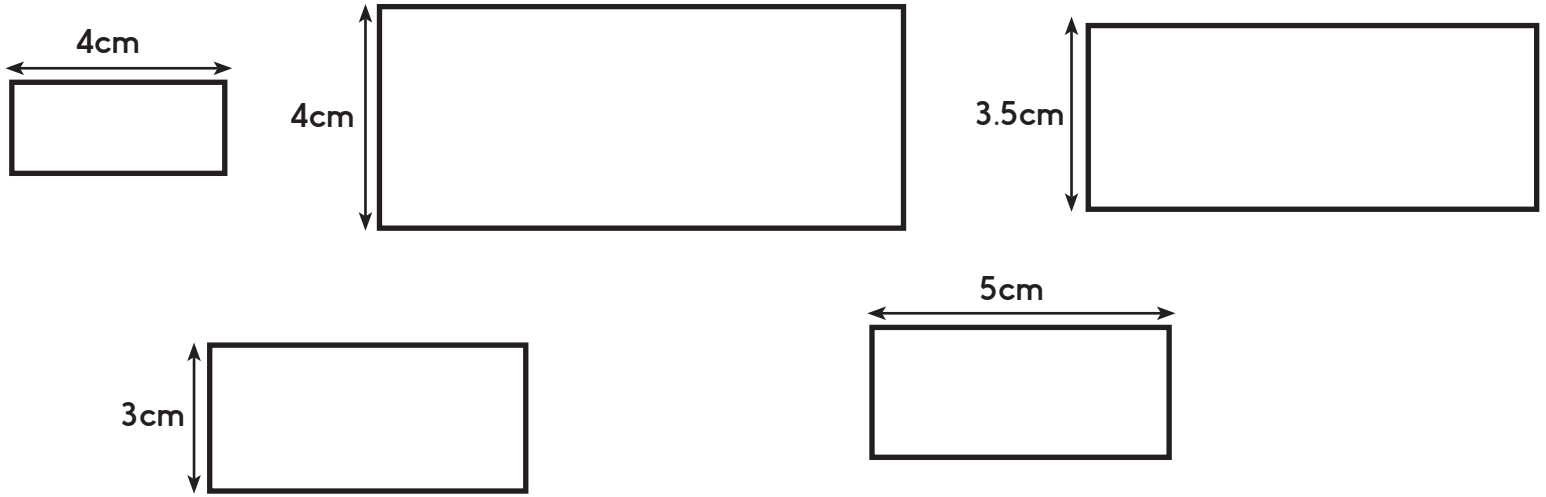
Today's tips are:

1. When solving ratio or scaling shape problems, check that the new shape looks like you have 'zoomed in or out' on a camera.
2. When calculating with ratios make sure that all the sides of a shape are multiplied or divided by the same amount (just like numerator and denominator to make an equivalent fraction).

Practice Sheet Mild

Ratio and scale problems

1. All these rectangles have sides with the ratio 2 to 1. Work out the length of the missing sides. The rectangles are **not** drawn to scale!



2. A designer is sketching a scale drawing of each room in a house. Each scaled down measurement should be $\frac{1}{10}$ of the real life measurement. Write how big each room should be on the designer's sketch.

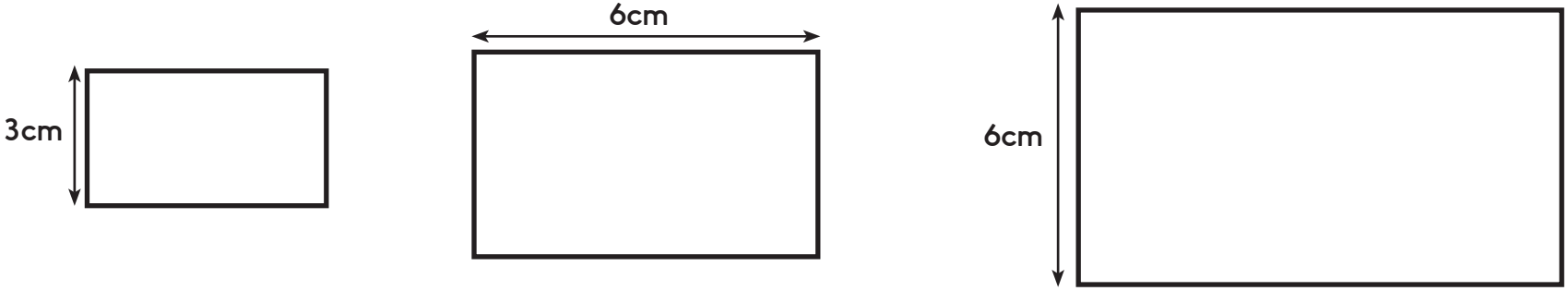
Living room	5m by 6m	Bedroom 1	4m by 5m
Kitchen	4.2m by 4.6m	Bedroom 2	4m by 3m
Bathroom	2.2m by 1.8m	Bedroom 3	2.4m by 3m

Practice Sheet Hot

Ratio and scale problems

1. All these rectangles have sides with the ratio 2 to 1. Work out the length of the missing sides. The rectangles are **not** drawn to scale!

2. All these rectangles have sides with the ratio 3 to 2. Work out the length of the missing sides. The rectangles are **not** drawn to scale!



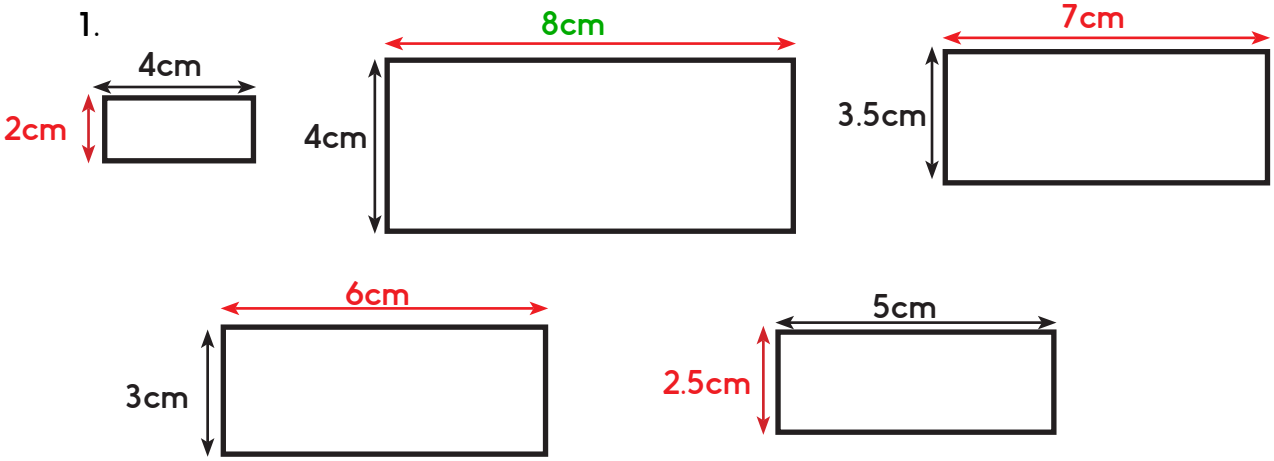
2. A designer is sketching a scale drawing of each room in a house. Each scaled down measurement should be $\frac{1}{20}$ of the real life measurement. Write how big each room should be on the designer's sketch.

Living room	5m by 6m	Bedroom 1	4m by 5m
Kitchen	4.2m by 4.6m	Bedroom 2	4m by 3m
Bathroom	2.2m by 1.8m	Bedroom 3	2.4m by 3m

Practice Sheets Answers

Ratio and scale problems (mild)

1.



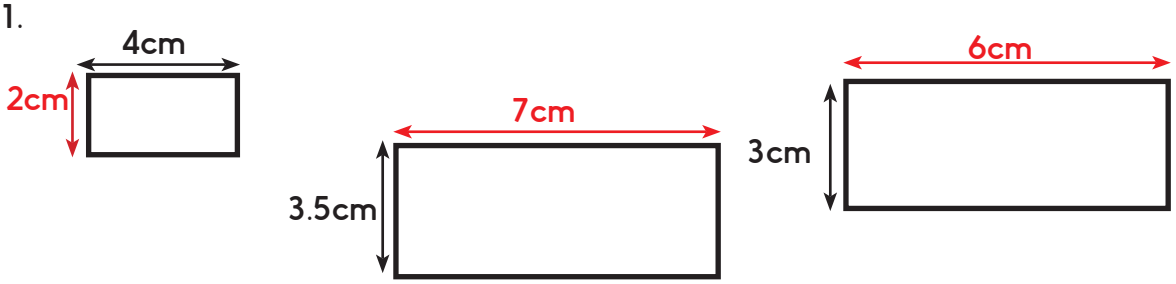
2.

Living room = 50cm by 60cm
Kitchen = 42cm by 46cm
Bathroom = 22cm by 18cm

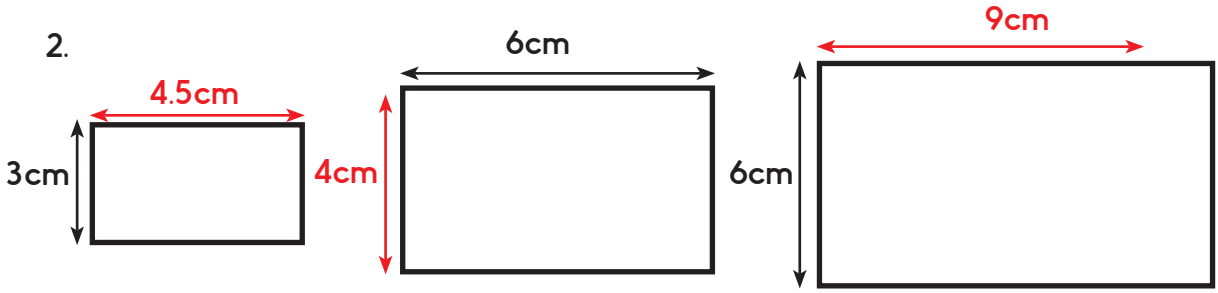
Bedroom 1 = 40cm by 50cm
Bedroom 2 = 40cm by 30cm
Bedroom 3 = 24cm by 30cm

Ratio and scale problems (hot)

1.



2.



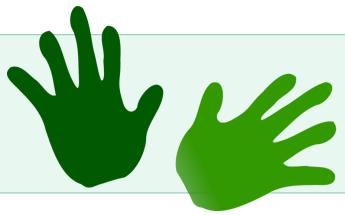
2.

Living room = 25cm by 30cm
Kitchen = 21cm by 23cm
Bathroom = 11cm by 9cm

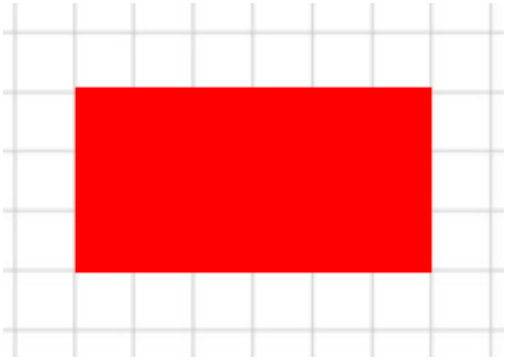
Bedroom 1 = 20cm by 25cm
Bedroom 2 = 20cm by 15cm
Bedroom 3 = 12cm by 15cm

A Bit Stuck?
Rectangle families

Things you will need:
- A pencil
- Paper



- This red rectangle has sides in the ratio 2 to 1. The longer side is twice the length of the shorter side.



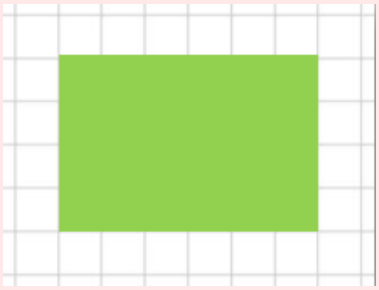
- Your challenge is to sketch at least four other rectangles in the same 'family': rectangles whose side lengths have the ratio 2 to 1.
- This blue rectangle has sides in the ratio 3 to 1. The longer side is three times the length of the shorter side.

- Your challenge is to sketch at least four other rectangles in the same 'family': rectangles whose side lengths have the ratio 3 to 1.

S-t-r-e-t-c-h:

Work out the missing numbers.

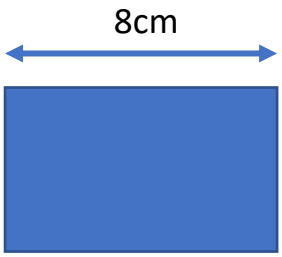
- This rectangle has sides in the ratio 3 to 2. The longer side is 1 and a half times the length of the shorter side.
- Can you sketch two more rectangles in the same family?

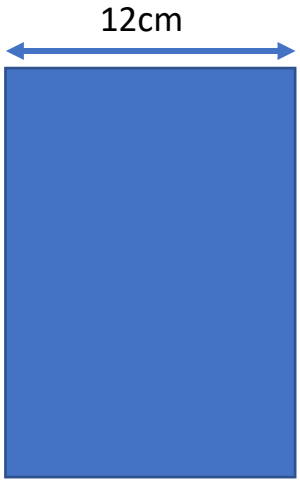


Check your understanding

Questions

These rectangles have side lengths with the ratio 4 to 3. Calculate the length of the missing sides. They are not drawn to scale!





The Blackpool Tower is 160 metres tall and 31 metres wide at its base.

i) Matt is making a scale model $^{1}/_{100}$ of the actual size.
How tall and wide should his model be?

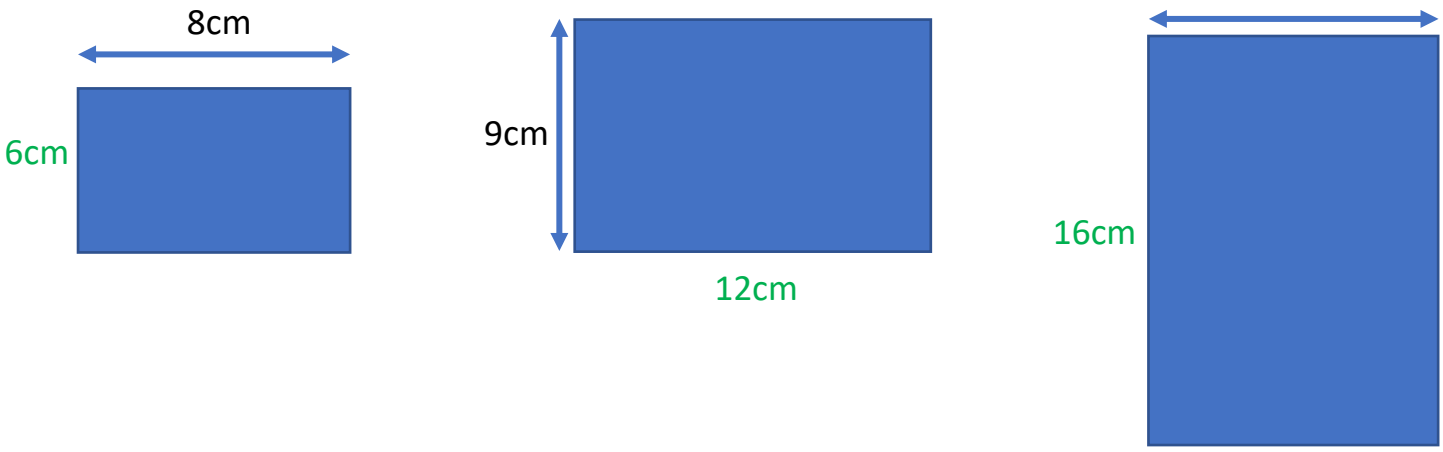
ii) Ally makes a scale model of the tower. Her model is 32 centimetres tall.
How wide is the base of her model?

Answers on the next page

Check your understanding

Answers

These rectangles have sides with the ratio 4 to 3. Calculate the length of the missing sides. They are not drawn to scale!



The Blackpool Tower is 160 metres tall and 31 metres wide at its base.

i) Matt is making a scale model $^1/_{100}$ of the actual size.
How tall and wide should his model be? 1.6m tall and 31cm wide.

ii) Ally makes a scale model of the tower. Her model is 32 centimetres tall.
How wide is the base of her model? 6.2cm - the scale of the model is 1:500. (Numerically 32cm is $^1/_5$ of 160 and then an adjustment for the units).