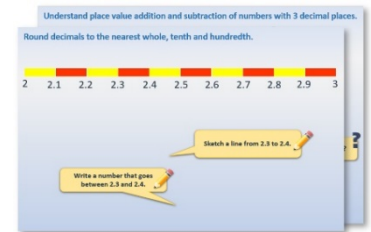


Week 10, Day 4

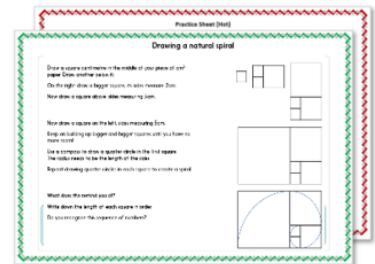
Exploring ratios (1)

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

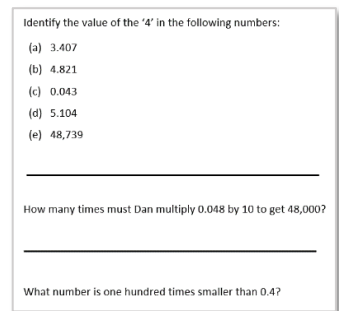
1. Start by reading through the **Learning Reminders**.



2. Think you've got it? Have a go at the **Investigative Practical Activity**.



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



Learning Reminders

Exploring ratios.

Ask as many people in your home as you can to draw a rectangle.

For each rectangle, measure the longer and shorter sides to the nearest millimetre.

For each rectangle, divide the longer side by the shorter side using a calculator.

What do you notice about the answers?

When large groups of people are asked to do this, a pattern emerges where many answers are between 1.4 and 1.8. How many of you drew rectangles in this range?

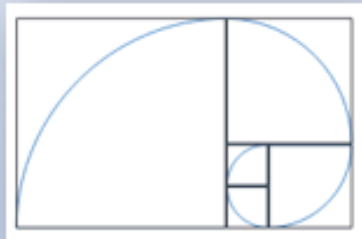


Measure the length and width of a debit/credit card. Divide the length by the width. What is the answer to one decimal place?

Learning Reminders

Exploring ratios.

The **Golden Section** (or Golden Mean) is a special ratio approximately equal to 1 to 1.618. Rectangles with this ratio are thought to be pleasing to the eye and so this ratio has been used in architecture for centuries. Egyptian pyramids have this ratio between their face heights and half the base.



There seem to be examples of this ratio in nature too.

Renaissance artists called this special ratio the Divine Proportion and used it in their artwork.

Investigation

Drawing a natural spiral

Draw a square centimetre in the middle of your piece of cm^2 paper. Draw another below it.

On the right draw a bigger square, its sides measure 2cm.

Now draw a square above, sides measuring 3cm.

Now draw a square on the left, sides measuring 5cm.

Keep on building up bigger and bigger squares until you have no more room!

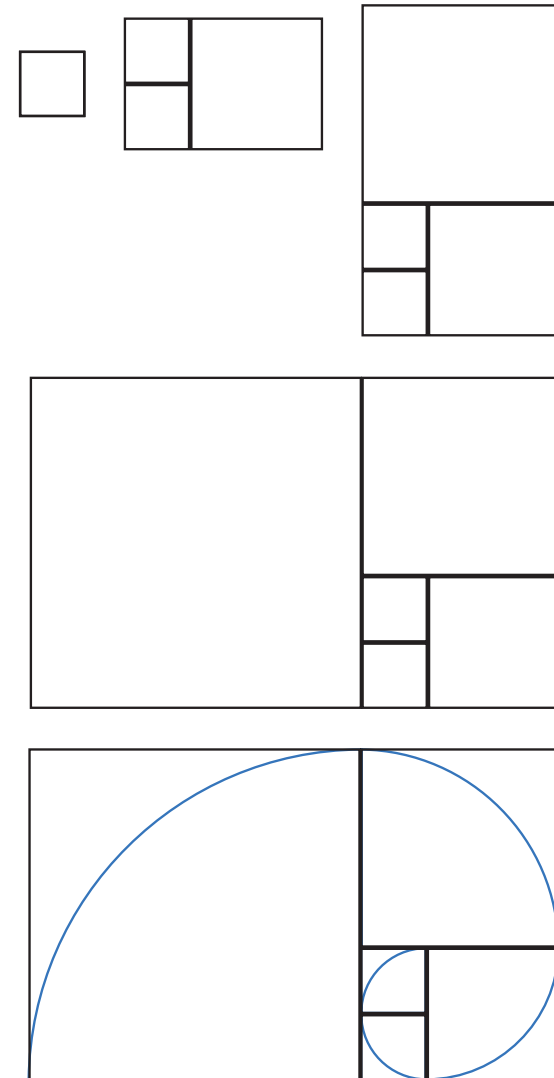
Use a compass to draw a quarter circle in the first square drawn. The radius needs to be the length of the sides. If you do not have compasses at home, sketch a quarter of a circle in each square as in the diagram.

Repeat drawing quarter circles in each square to create a spiral.

What does this remind you of?

Write down the length of each square in order.

Do you recognise this sequence of numbers?



Check your understanding

Questions

Orange paint is mixed using this ratio of red and yellow paints:

red : yellow

2 : 7

Sam uses 4 litres of red.

Assuming he uses the correct amount of yellow, how many litres of orange paint will he make?

Draw a rectangle where the ratio of the longer side to the shorter side is 3 to 2.

Draw a different size rectangle with the same ratio.

A square of side length a has an area = 16cm^2 .

Another square, of side length b , has an area = 100cm^2 .

What is the ratio of their side lengths, $a : b$?

Fold here to hide answers.

Check your understanding

Answers

Orange paint is mixed using this ratio of red and yellow paints:

red : yellow

2 : 7

Sam uses 4 litres of red.

Assuming he uses the correct amount of yellow, how many litres of orange paint will he make? **18 litres.** If he uses 4 litres of red, then he must use 14 litres of yellow to maintain the red : yellow ratio.

Draw a rectangle where the ratio of the longer side to the shorter side is 3 to 2.

Draw a different size rectangle with the same ratio.

Accept a pair of rectangles where the longer side is 1.5 times longer than the other side, e.g. 6cm by 4cm or 9cm by 6cm.

A square of side length a has an area = 16cm^2 .

Another square, of side length b , has an area = 100cm^2 .

What is the ratio of their side lengths, $a : b$? **4:10 (or 2:5) since the length of the squares are 4cm and 10cm respectively.**