Did you know?

We measure the rotation of the Earth in terms of hours. Each rotation is 24 hours in respect to the sun. The Earth's rotation is actually slowing down, so days would have been shorter in previous times. This is due to the moon's effect on the rotation.

The average depth of the ocean is about 13,000 ft. This is around 2.5 miles. Parts of the ocean will never have sunlight. This part of the ocean is called the "deep sea".

The mass of the Earth constantly changes. It gains approximately 40,000 tons each year due to particles from space.

In ancient Egypt, the Pharaoh's surveyors used measurements based on body parts to measure land and buildings.
A cubit – is measured from the elbow to the fingertip.
A digit – this is a finger, used for counting. How does this word fit with "digital age"?
The phrase "rule of thumb" comes from carpenters using a thumb to measure approximately an inch.

KS3 Spine
MEASUREMENT
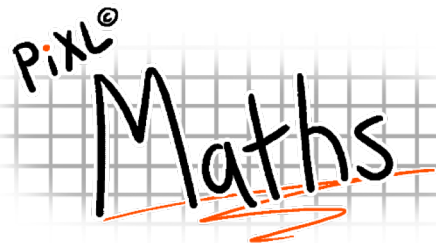
"2 hours 45 mins is the same as 2.45"
Incorrect because…
Start with an example of something you know; 2hours 30 mins is 2.5 hours *"two and a half hours"*. We wouldn't read this as *"two hours 50 minutes"*.
We need to calculate the minutes as a fraction of an hour.

$45 \; mins = \dfrac{45}{60} = 0.75 \; hour$

2.3 hours in minutes would be;
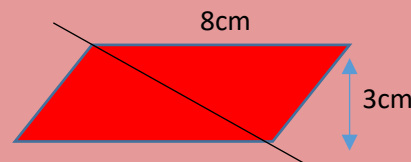$2 \times 60 = 120$
$0.3 \times 60 = 18$ Total 138 mins

**"The area of a triangle is easy, because its just half a rectangle"**
The most common mistake is to forget to divide by two.
A triangle is half of a **parallelogram.** This is important because we use the **perpendicular height** of the triangle in the same way we do for a parallelogram.

8cm

3cm

$area \; of \; triangle$
$= \dfrac{1}{2}(l \times h)$
$Or \; \dfrac{1}{2}(Base \times height)$

"The area of a parallelogram is length times width because its just like a rectangle" incorrect because….

Rectangle

Width

Length

$area = l \times w$

Perpendicular height (h)

Length (l)

$area = l \times h$
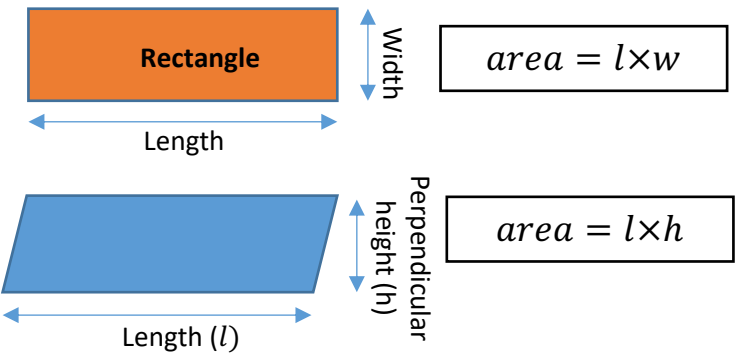
So why can't we just use the slanted edge?

If we continued to reduce the **perpendicular height** the area would reduce, but the edge would remain the same therefore it wouldn't work. e.g.

7cm

3cm

8cm

$area = 8 \times 3$
$24cm^2$
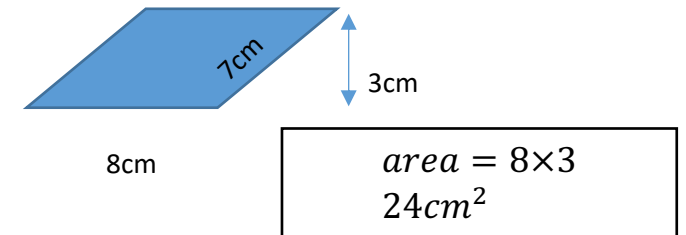
There are other ways to see this- can you see how to use triangles and rectangles to find the area? Investigate different ways to show the area of a parallelogram.

Test Me!

Each question matches the checklist of basic skill.

1. Convert the following into cm
   a) 30mm   b) 4cm 45mm   c) 12m

2. Convert the following into mm
   a) 3cm   b) 33m   c) 13cm 4mm

3. Write down the formula for the area of
   a) rectangle   b) triangle   c) parallelogram

4. Calculate the area of a triangle with base 4cm and height 12cm.

5. The two triangles are similar. Calculate the length of the missing side.

?cm

12cm

3cm

9cm
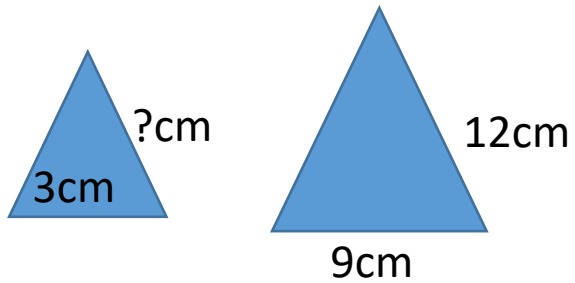
Challenge

These questions test your understanding of the misconceptions people have.

1. The time is 3.04pm a journey takes 67 minutes. What time will the journey end?

2. Convert the following into minutes
   a) 1 hour 34 mins   b) 2.65 hours

3. The area of the triangle and the parallelogram are the same. Find the perimeter of the triangle.

a $2a$

3

$a + 6$

3

$2a + 1$
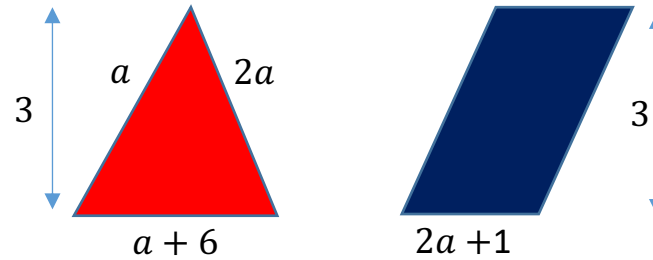
4. The area of the compound shape is $47cm^2$. Can you find possible lengths for sides a and b (whole numbers). Can you find any other possible values?(there are lots of possible answers here!)

3

b

a

7
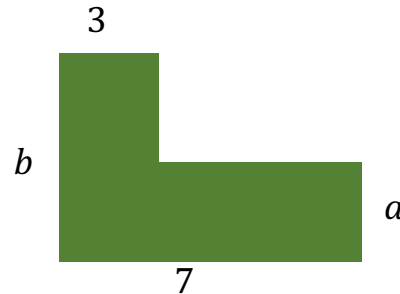
Extend

Each question uses the same diagram **BUT** you will have to do a different calculation using the skills you have. When you are answering the questions try and think or write down what is the **same** and what is **different** about each question.
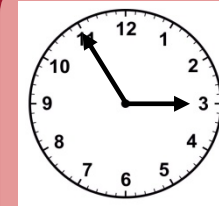
1. What time is on the clock?
2. What time will it be in 34 minutes?
3. I start watching a program at 1.20 and it finishes at the time on the clock. How many MINUTES is the programme? Write the length in hours.
4. What is the acute angle between hands?

1. Measure each side of the rectangle to the nearest mm.
2. Calculate the perimeter, round your answer to the nearest cm.
3. Draw all the lines of symmetry.

Maths KS3 Measurement