# GCSE Maths – Geometry and Measures

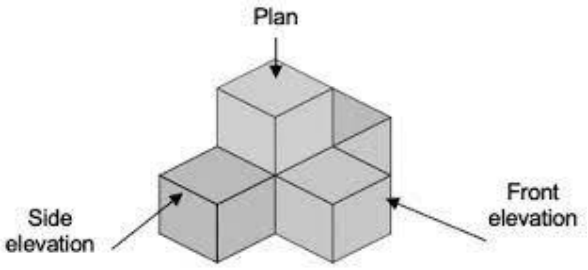
## Plans and Elevations

Notes

WORKSHEET

# Plans and Elevations

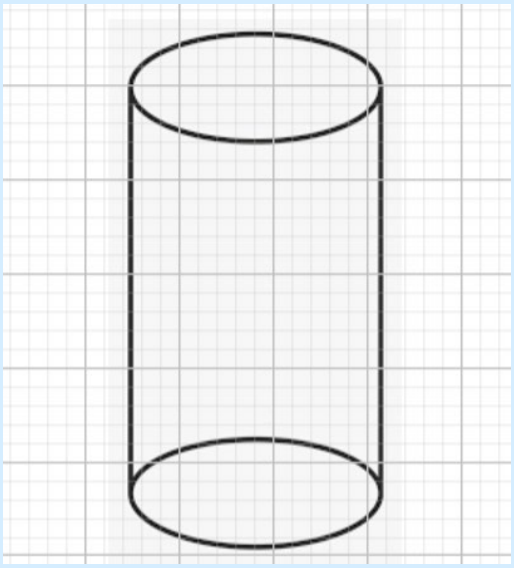
Plans and elevations are 2D drawings which show **different views** of a 3D shape. The **2D drawings** are to scale. This means plans and elevations are used in **industries** such as product design and architecture.



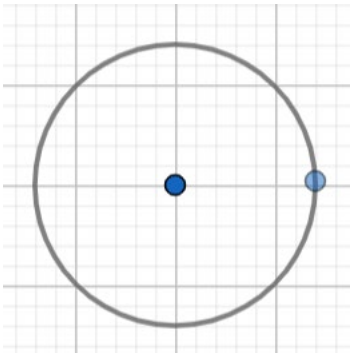

## Plans

A plan is the view of the 3D shape from **the top**. It can be thought of as the **'bird's eye view'**. The scale of the drawing must be the same scale of the 3D solid, unless stated otherwise.

**Example:** Draw the plan of the following cylinder



*If we viewed this cylinder from a 'birds eye view', i.e. from the top, we would see a circle with a diameter of* $2.4\ cm$*:*

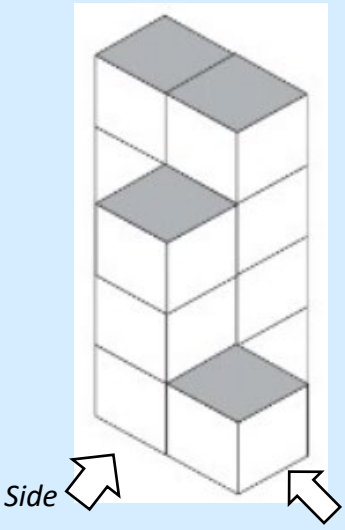


*It is important that the scale of the plan view matches the scale of the given 3D shape.*

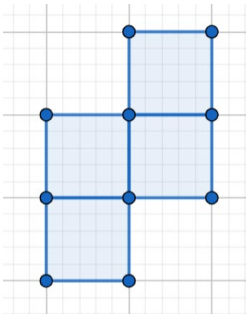
# Elevations

An elevation is a view of the 3D solid from the **side** or **front**. This means you could be asked to draw the **front elevation** or the **side elevation**. **Arrows** will usually be used to specify which side of the shape is the front. As with plan drawings, the drawings must be **to scale**.

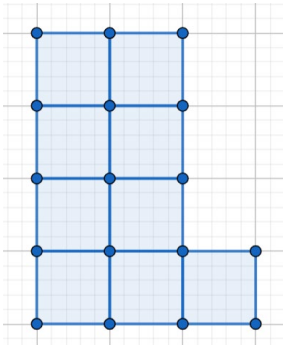
**Example:** Sketch the plan, side elevation and front elevation of the following shape



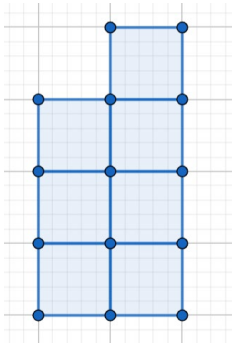

***Plan**: Looking down onto the top, we would only see the grey shaded squares. Even if we do not know the scale, we can still sketch the number of squares.*



***Side Elevation:** From the specified side view, we would see a 4 x 2 rectangle with an extra square on the right.*



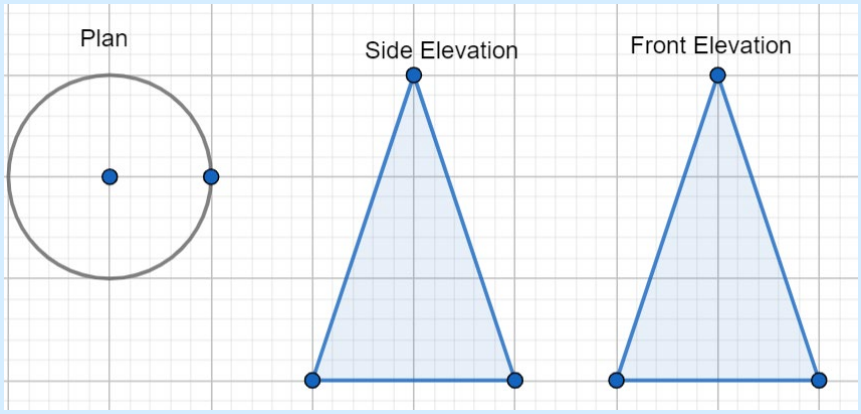
***Front Elevation:** From the specified front view, we would only see a 3 x 2 rectangle and a square on the top right.*



As well as being able to draw the 2D plan and elevation drawings from a 3D shape, it is also possible to **construct the 3D shape** from given plan and elevation drawings.

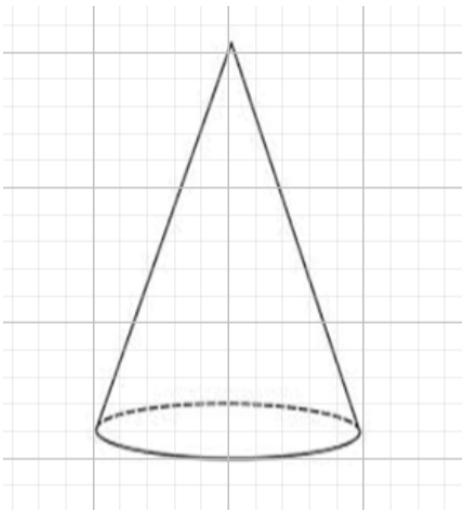
To do this, use the given 2D drawings to **visualise** each different viewpoint, not forgetting to maintain the **same scale**. Once you've constructed the 3D shape, you can **check** it is correct by drawing the plan and elevation drawings. These should **match** the 2D drawings which you started with.

**Example:** Below is a sketch of the plan, side elevation and front elevation for a 3D shape. Draw the corresponding 3D shape.



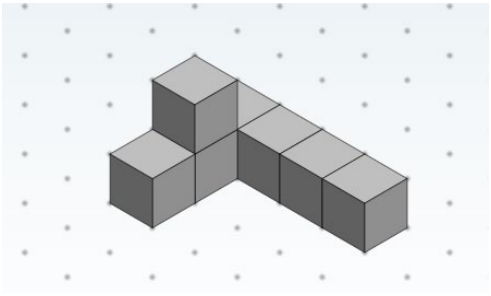

- *From the **plan** view we can deduce that from the top the shape looks like a circle with a radius of 1.*
- *The **front elevation** and **side elevation** are the same. Each are a triangle with base 2 and height of 3. This suggests that the 3D solid is a cone, with height 3 and radius 1.*

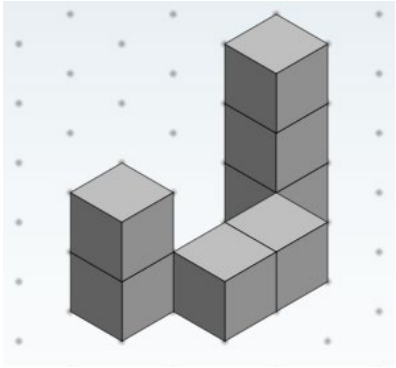
  *Therefore, we draw a cone with height 3 (3 big squares high) and radius 1 (1 big square across):*



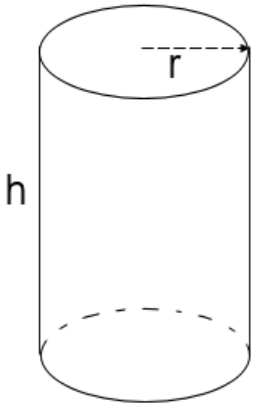
# Plans and Elevations – Practice Questions

1. Draw the plan, side elevation and front elevation for each solid to the correct scale.

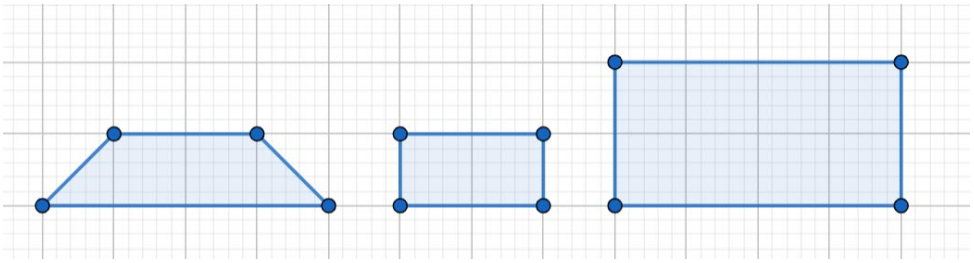
a) 

b) 

2. Draw the plan, side elevation and front elevation for the following solid to the correct scale, where $r = 2$ cm and $h = 4$ cm.




3. The image below shows the front elevation, side elevation and plan respectively. Draw the 3D solid to the correct scale.



*Worked solutions for the practice questions can be found amongst the worked solutions for the corresponding worksheet file.*