

# THIRD ANGLE ORTHOGRAPHIC PROJECTION

YEAR 10  
GCSE

## THIRD ANGLE ORTHOGRAPHIC

Just like the orthodontist and orthopaedic surgeons straightened misaligned teeth and bones, an orthographic drawing also puts things **in line** with each other.

This is the most common way of showing a working drawing. It is used to produce **accurate drawings** to give to a **manufacturer/3<sup>rd</sup> party to make**.

*If you were asked to make this toy right now, do you think you'd be able to make it?*

*What information would you need?*

ORTHO-dontist  
ORTHO-peadic

Deal with misaligned  
teeth and bones

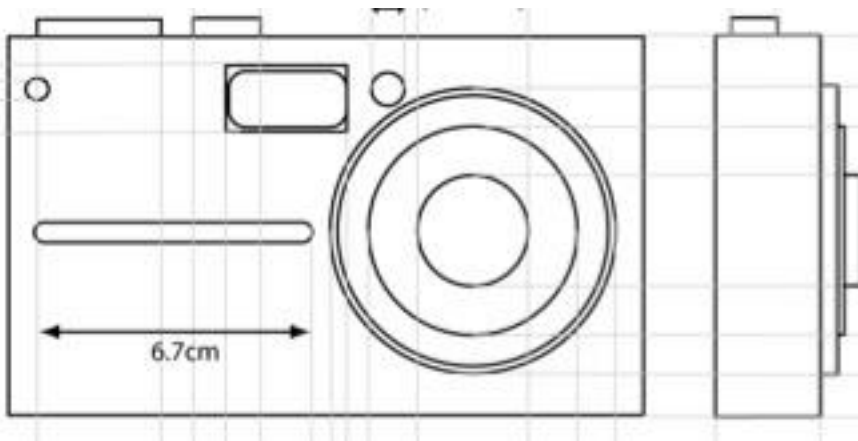
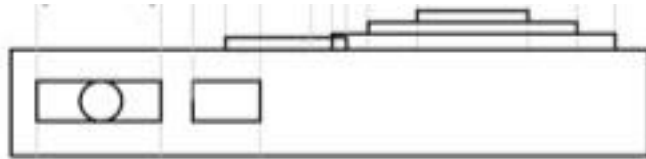
THIRD ANGLE  
ORTHOGRAPHIC



- What material will it be made from?
- What size is the product?
- How big are the parts?
- Is it a hollow or solid shape?
- What does the back look like?
- What do the sides look like?
- What does the base/top look like?



THIRD ANGLE  
ORTHOGRAPHIC



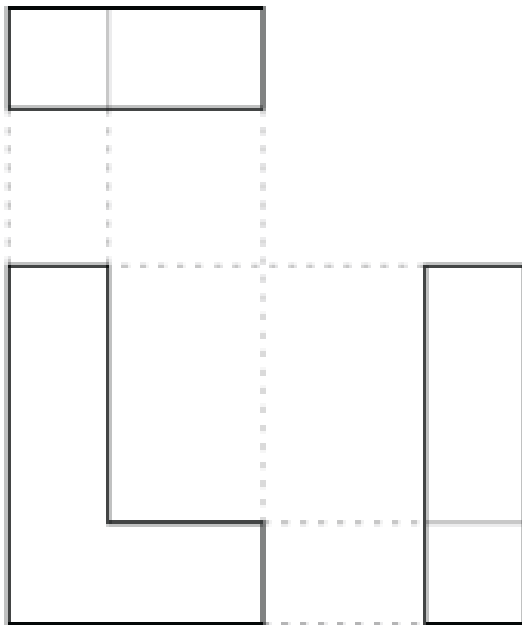
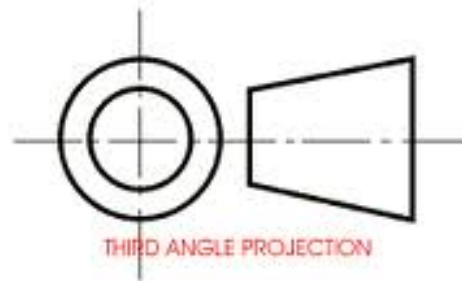
[http://www.youtube.com/watch?v=\\_wDpN6Zi1hE&feature=player\\_detailpage](http://www.youtube.com/watch?v=_wDpN6Zi1hE&feature=player_detailpage)

Third angle orthographic must show three different views:

- Front View (looking at the front of a product)
- Plan View (drawn directly above the front view)
- End/Side view (drawn by looking at the end/side of a product)

The views are **always** set out the same way. The 3<sup>rd</sup> angle orthographic projection symbol is added to diagrams to help explain their layout:

Third angle projection



#### Key terms

**Dimensions:** sizes, usually in millimetres (mm).

**Third angle orthographic projection:** a standard technique for producing detail and working drawings that everyone can understand.

**Front view:** a view looking towards the front of your product.

**Plan view:** a view looking down at the top of your product.

**End/side view:** a view looking at the side or end of your product.

**Hidden detail:** lines which you know exist but you cannot see.

THIRD ANGLE  
ORTHOGRAPHIC

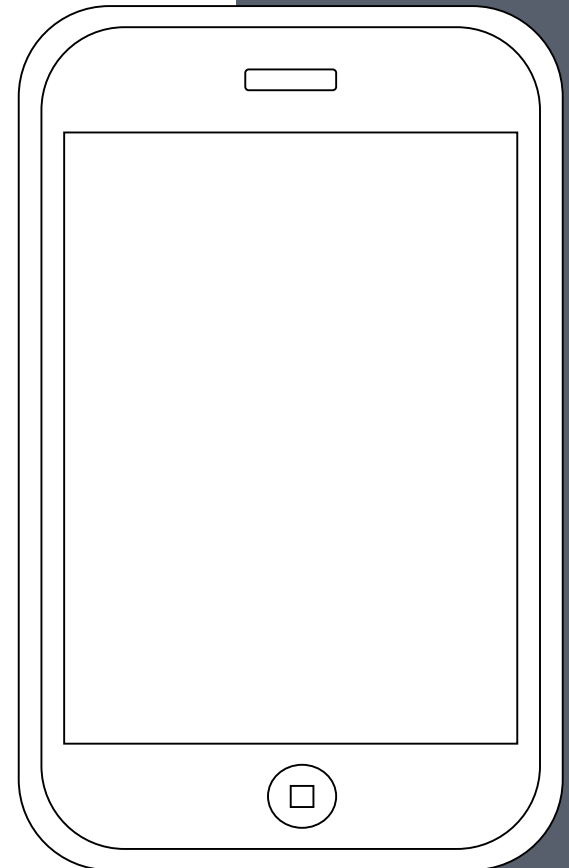
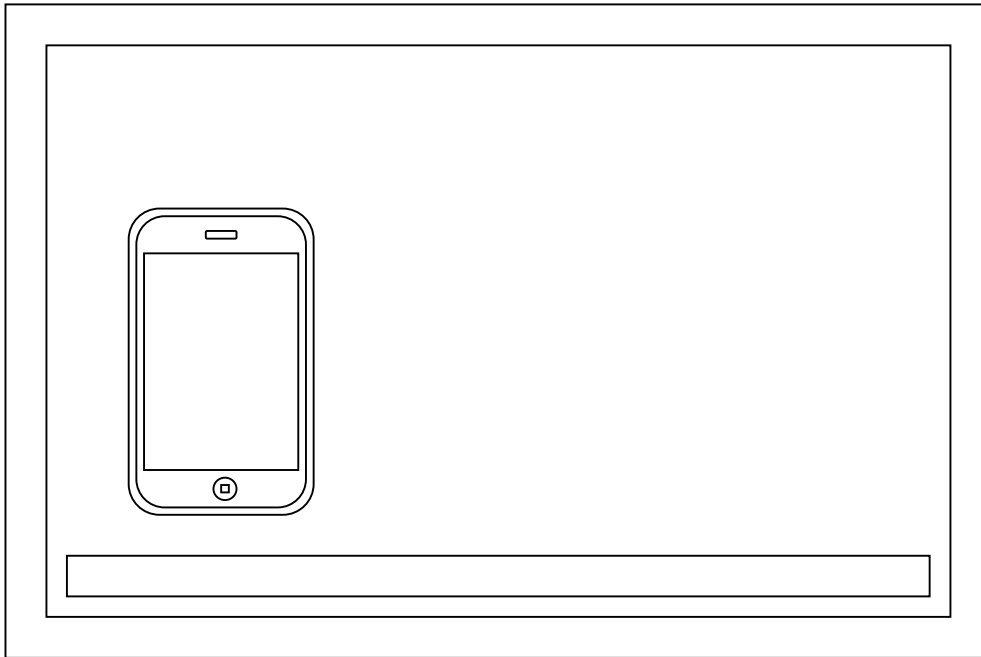
# STEP ONE

## Drawing a mobile phone in third angle orthographic

Your phone drawing is already located in the bottom left hand corner of your page displaying the front view of the product.

THIRD ANGLE  
ORTHOGRAPHIC

MOBILE PHONE

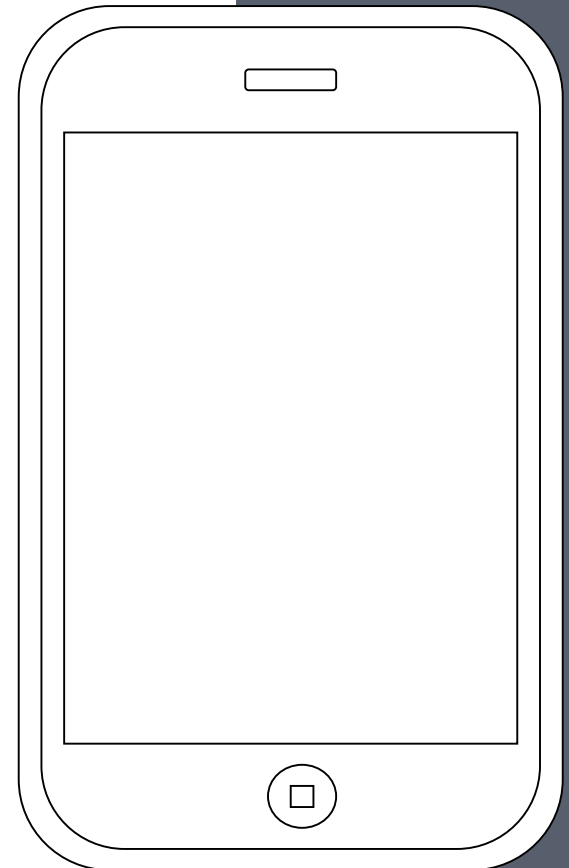
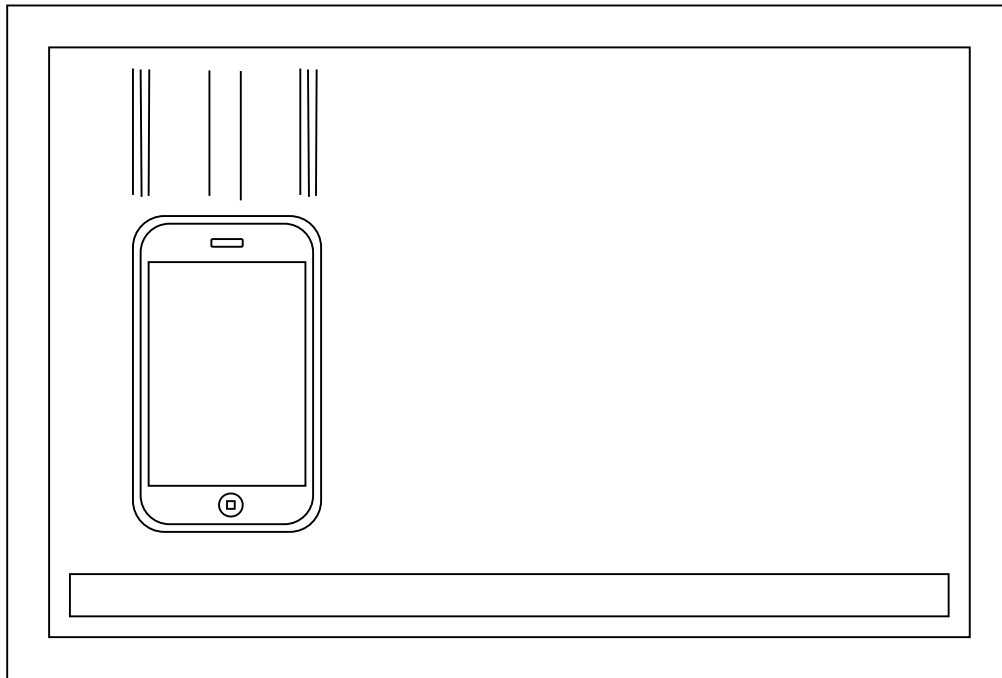


# STEP TWO

Draw construction lines coming from the key dimensions of the product. These should be lightly drawn in pencil and should not touch the object.

THIRD ANGLE  
ORTHOGRAPHIC

MOBILE PHONE

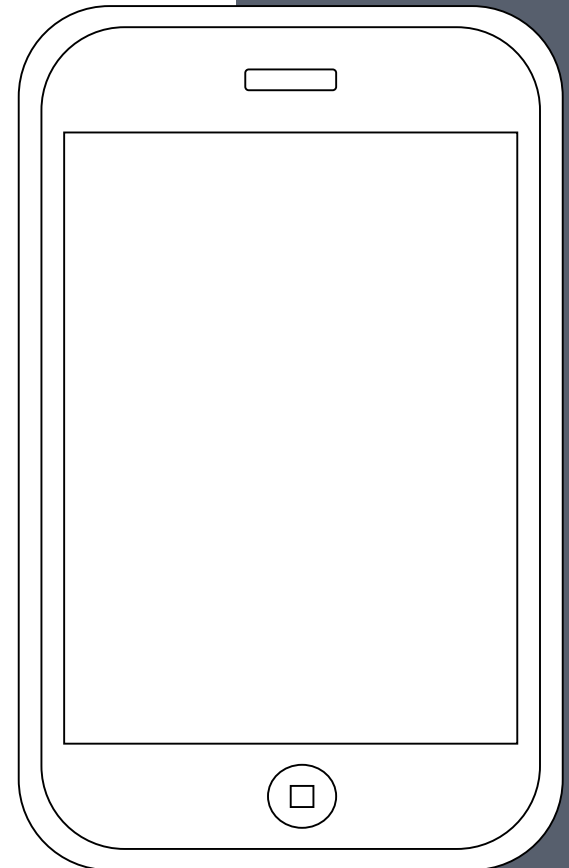
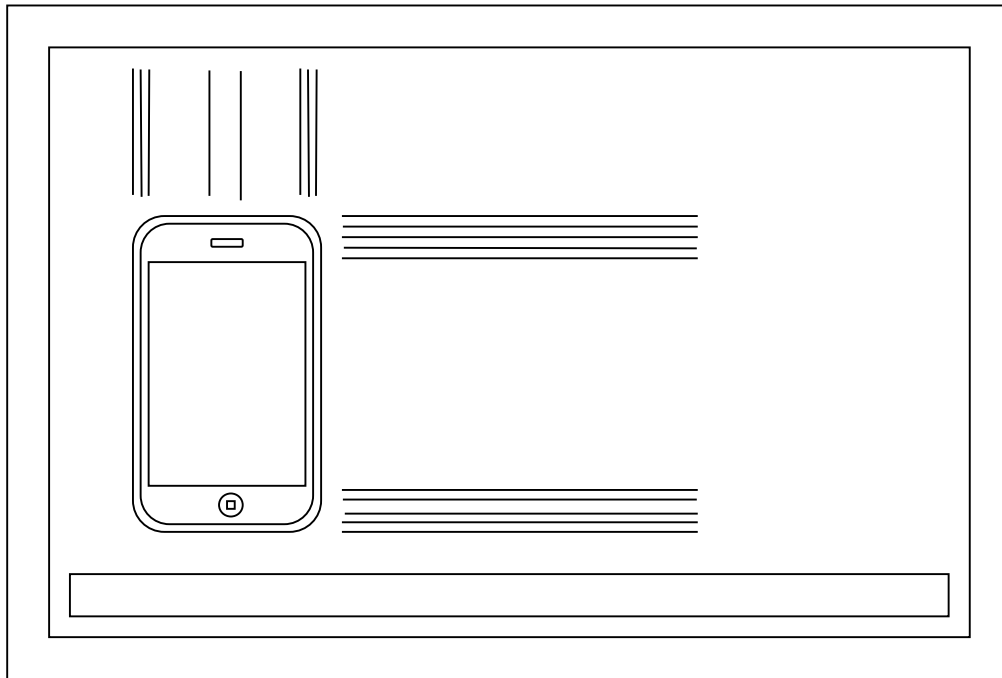


# STEP THREE

Draw construction lines coming from the key dimensions of the product. These should be lightly drawn in pencil and should not touch the object.

THIRD ANGLE  
ORTHOGRAPHIC

MOBILE PHONE

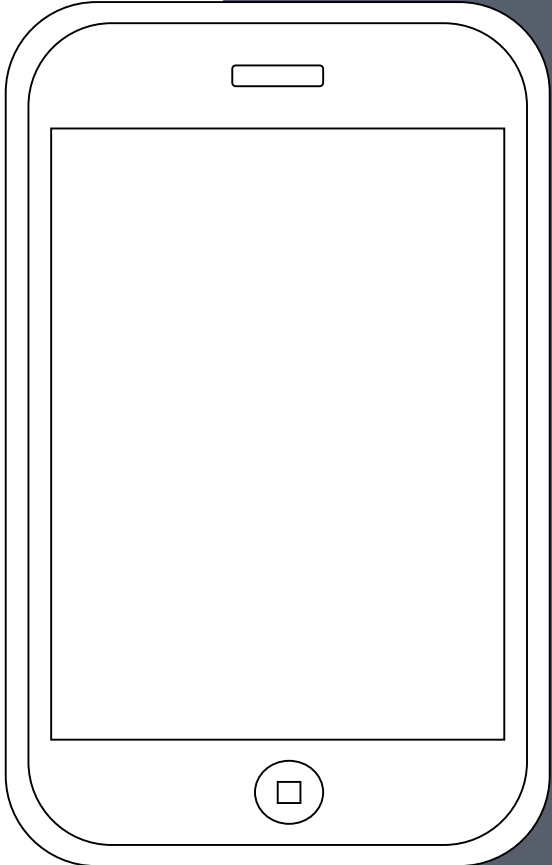
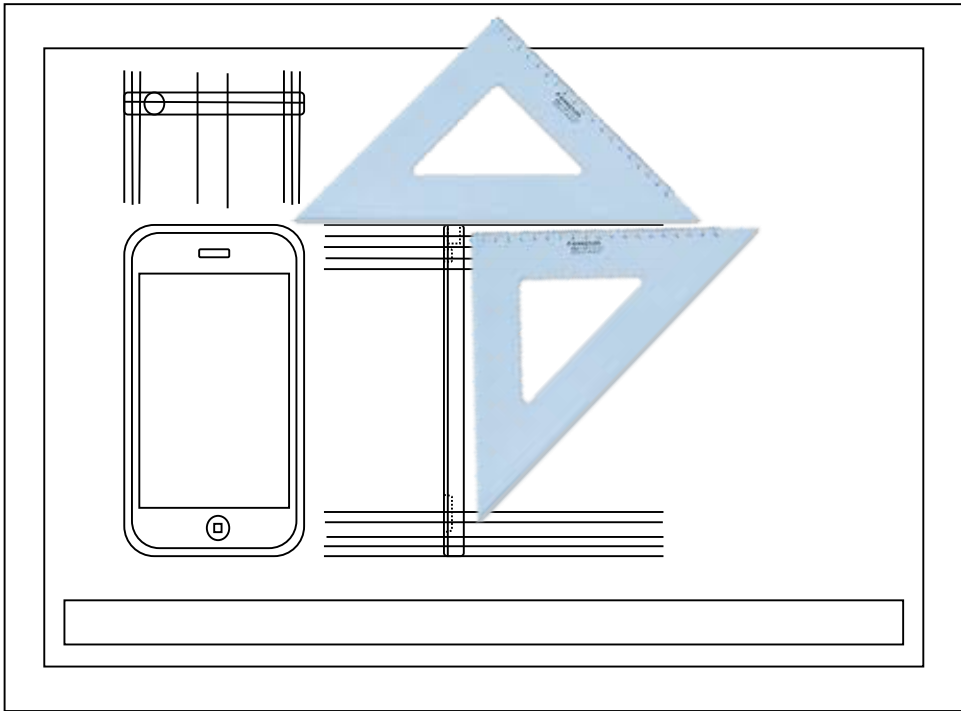


# STEP FOUR

Draw the plan view and the side view of the iPhone as shown.

THIRD ANGLE  
ORTHOGRAPHIC

MOBILE PHONE

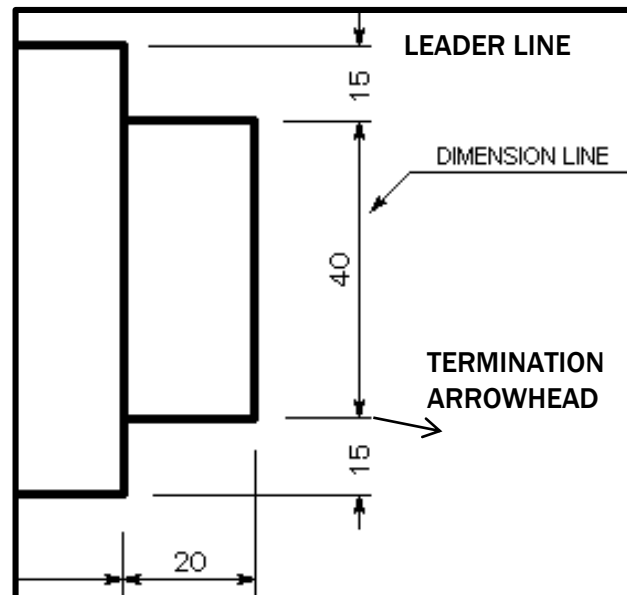
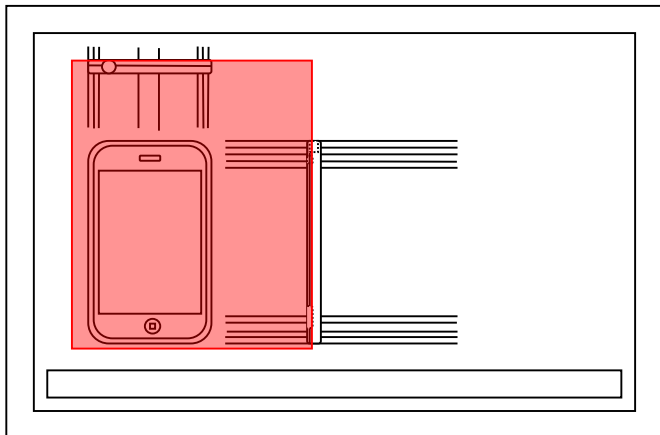




# STEP FIVE

## Adding on dimensions

- Always use **millimetres** on your drawings
  - Numbers should read from the **front or the right**
  - The **leader line** should not touch the object
  - The dimension should be in the **middle** of the line
  - **Termination arrowheads** should be **solid and to a point**
- 
- Never place dimensions within the drawing area.
  - Never repeat a dimension.



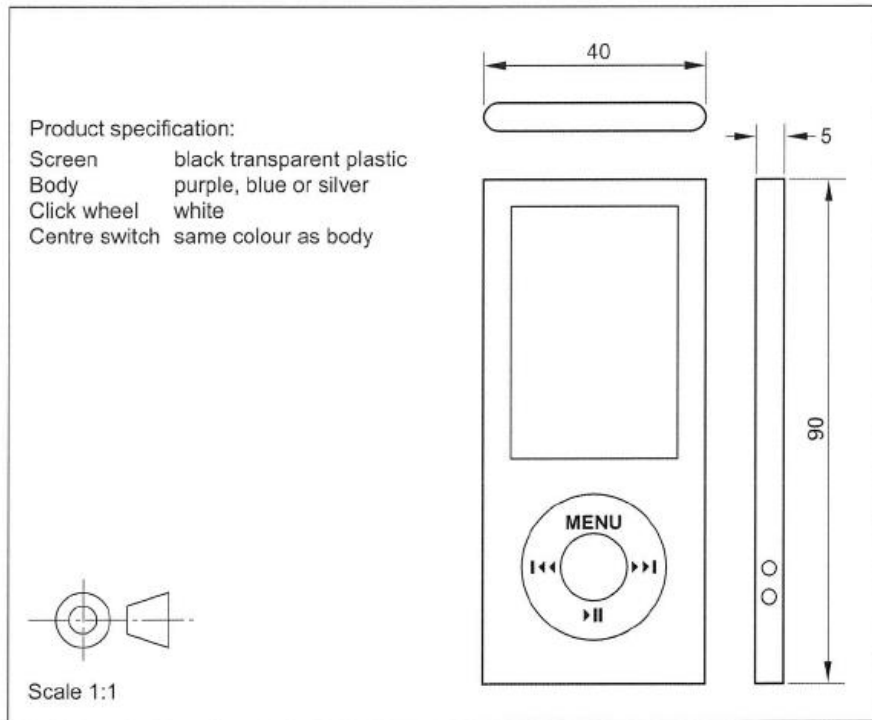
**DIMENSIONING**

This question is about 3-D sketching and rendering and is worth 10 marks.

You are advised to spend about 10 minutes on this question.

5 The orthographic drawing below is of a music storage device.

Dimensions are given in millimetres (mm).

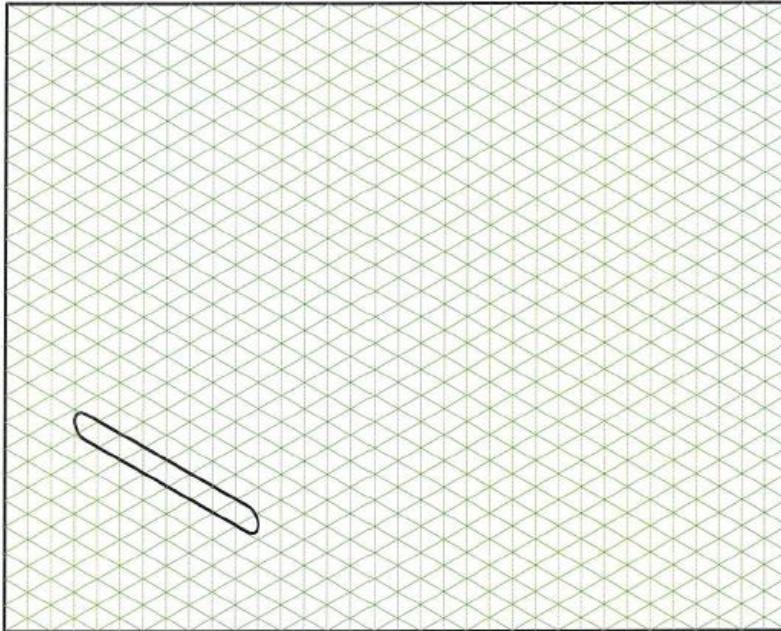


## EXAM QUESTION

Sometimes  
given a task in  
Orthographic  
and asked to  
draw in  
Isometric!

- 5 (a) Using the information opposite, complete the full-size isometric sketch of the music storage device.

Estimate any sizes not given.



(6 marks)

- 5 (b) Add thick and thin lines to enhance your drawing. (2 marks)
- 5 (c) Render the plastic screen to represent a black transparent shiny surface. (2 marks)

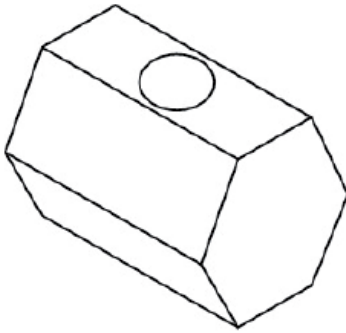
**ISOMETRIC**  
Can you do it?

# CONVERT 3D TO ORTHO- GRAPHIC!

This question is about Orthographic Projection.

You are advised to spend about 15 minutes on this question.

- 6 Below is a box with a clear plastic window used to package chocolates.



The radius of the circular window in the middle of the top face is 10 mm

The grid opposite shows an incomplete orthographic drawing of the box.

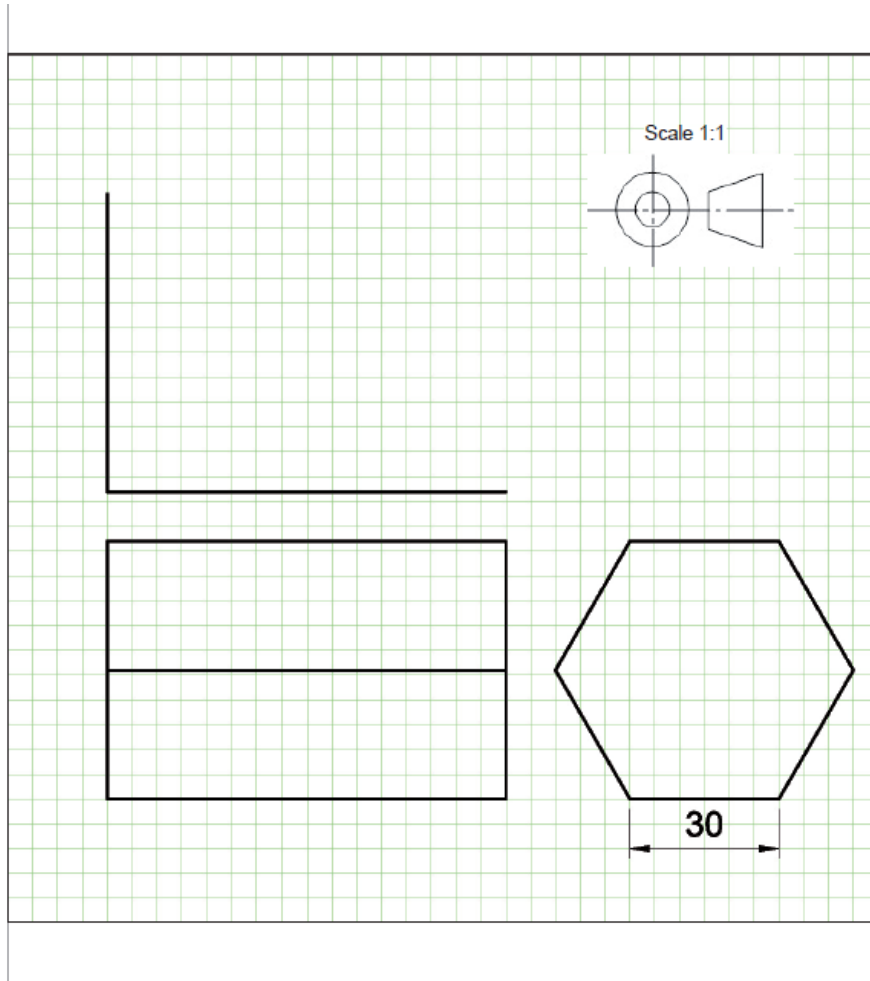
- 6 (a) Complete the orthographic drawing of the box by adding the missing lines. [6 marks]

Do not include hidden detail lines

- 6 (b) The dimensions given for one side use British Standard conventions. [6 marks]

Add the following dimensions to the drawing:

- the length of the chocolate box
- the height of the chocolate box
- the size of the circular window.



**FINISH IT  
OFF!**

6 (c) Explain the meaning of 'Scale 1:1' shown in the drawing on page 19.

[2 marks]

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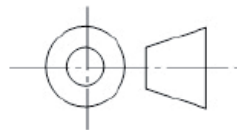
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6 (d) Explain the meaning of the following symbol shown in the drawing below.

[2 marks]



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# AQA EXAM QUESTION

Do you know the answer?