

# Interpenetrations

## EGD Grade 11 & 12 (Revision)

Developed by: PC Viljoen

Senior Educational Specialist for  
Engineering Graphics and Design

Free State Province



education

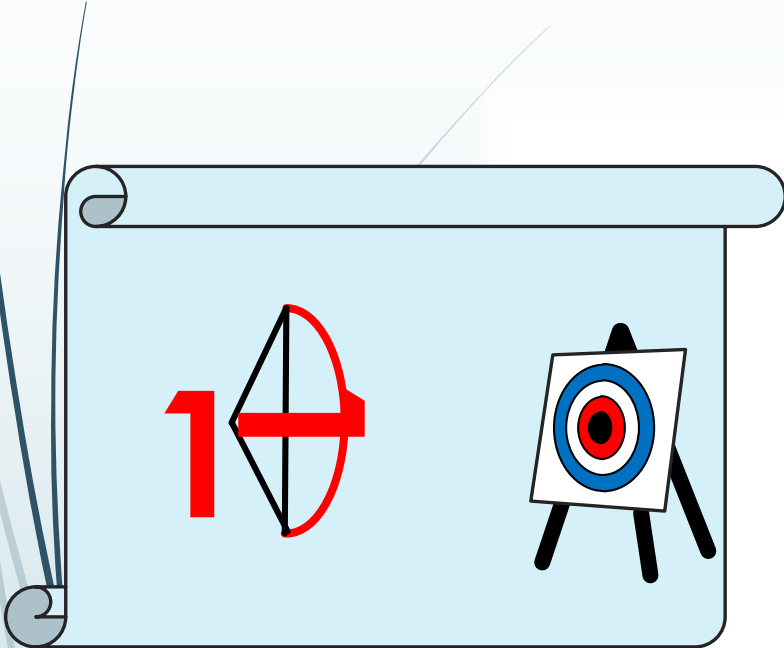
Department of  
Education  
FREE STATE PROVINCE



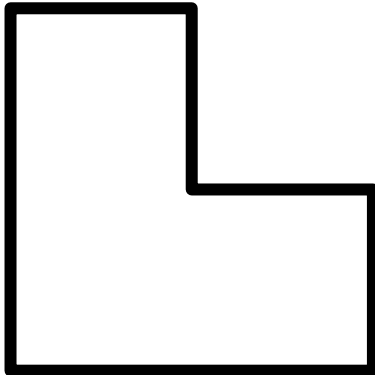
# First Angle Orthographic Projections

Developed by: PC Viljoen  
Senior Educational Specialist for  
Engineering Graphics and Design  
Free State Province

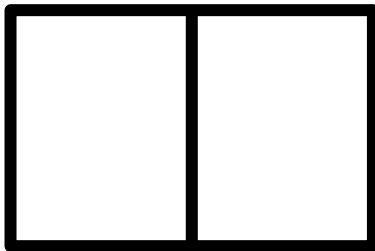
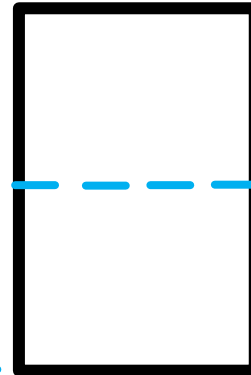
# First Angle Orthographic Projections (F.A.O.P.)



Front view

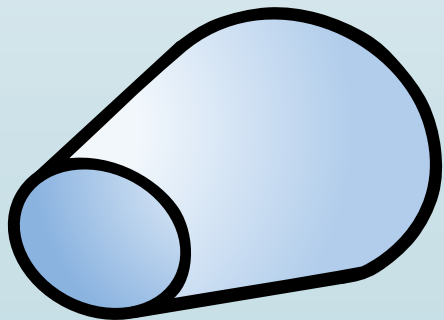
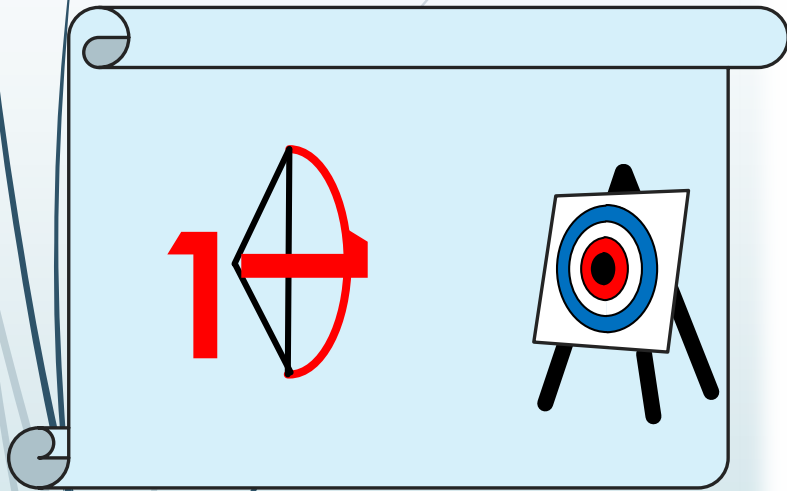


Left view



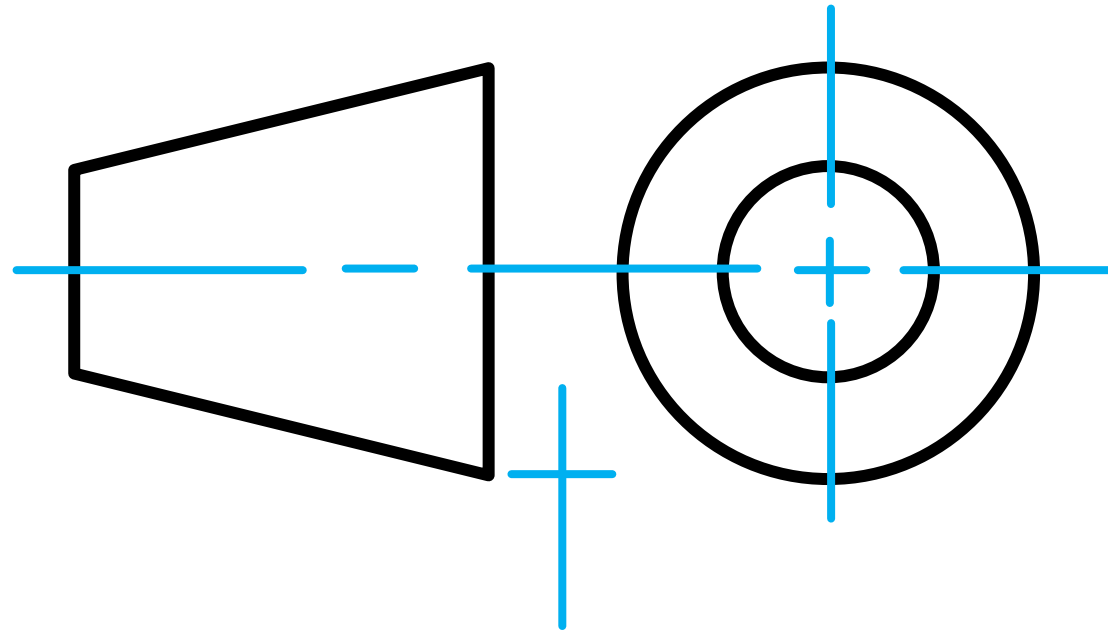
Top view

# Projection symbol for First Angle Orthographic Projections



Front view

Left view

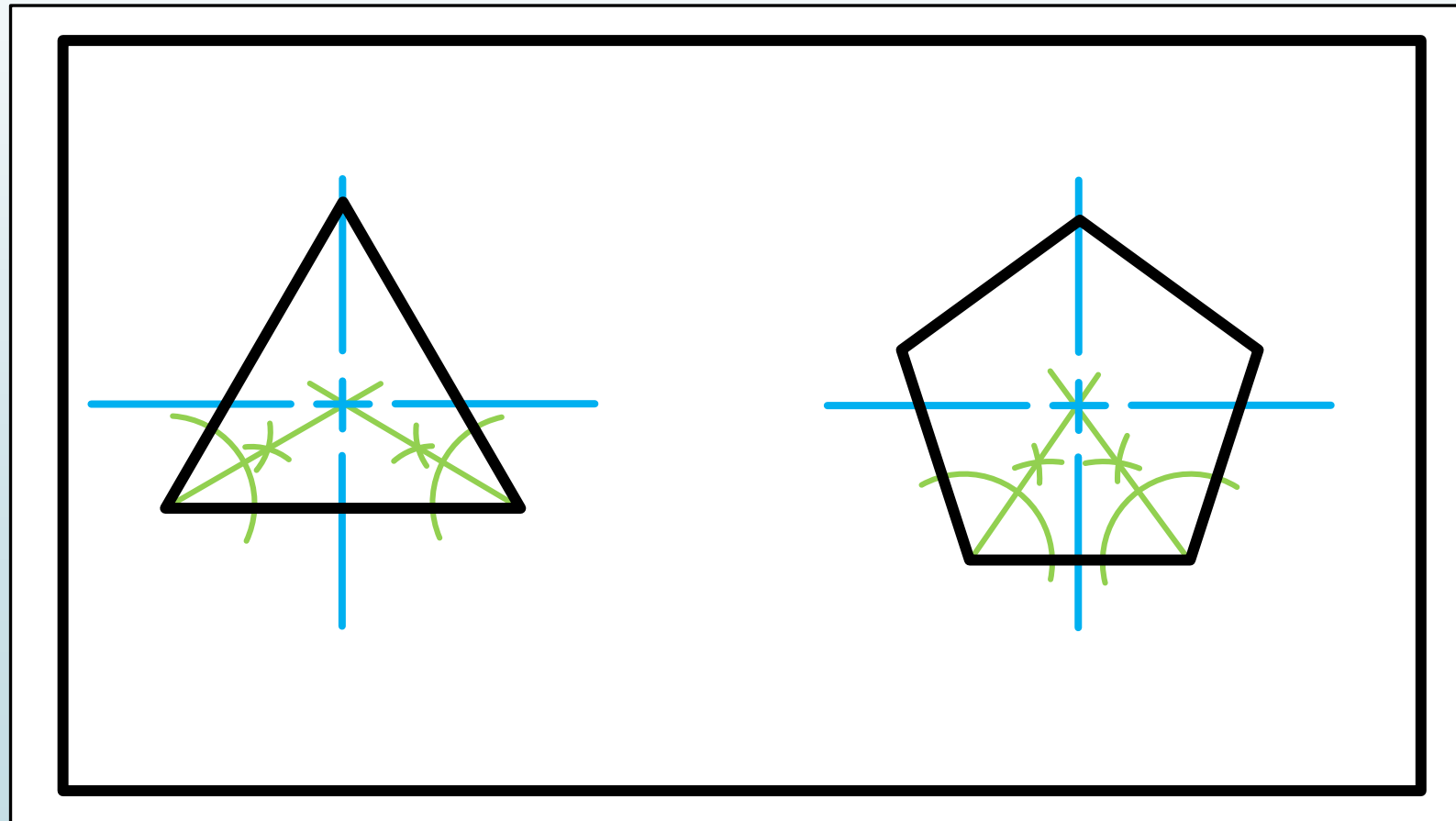


# First Angle Orthographic Projections (F.A.O.P.)

- All work on Paper 1 will normally be in F.A.O.P unless otherwise stated:
  - Civil analytical drawings
  - Solid Geometry
  - **Interpenetrations**
  - Transition pieces
  - Civil drawings

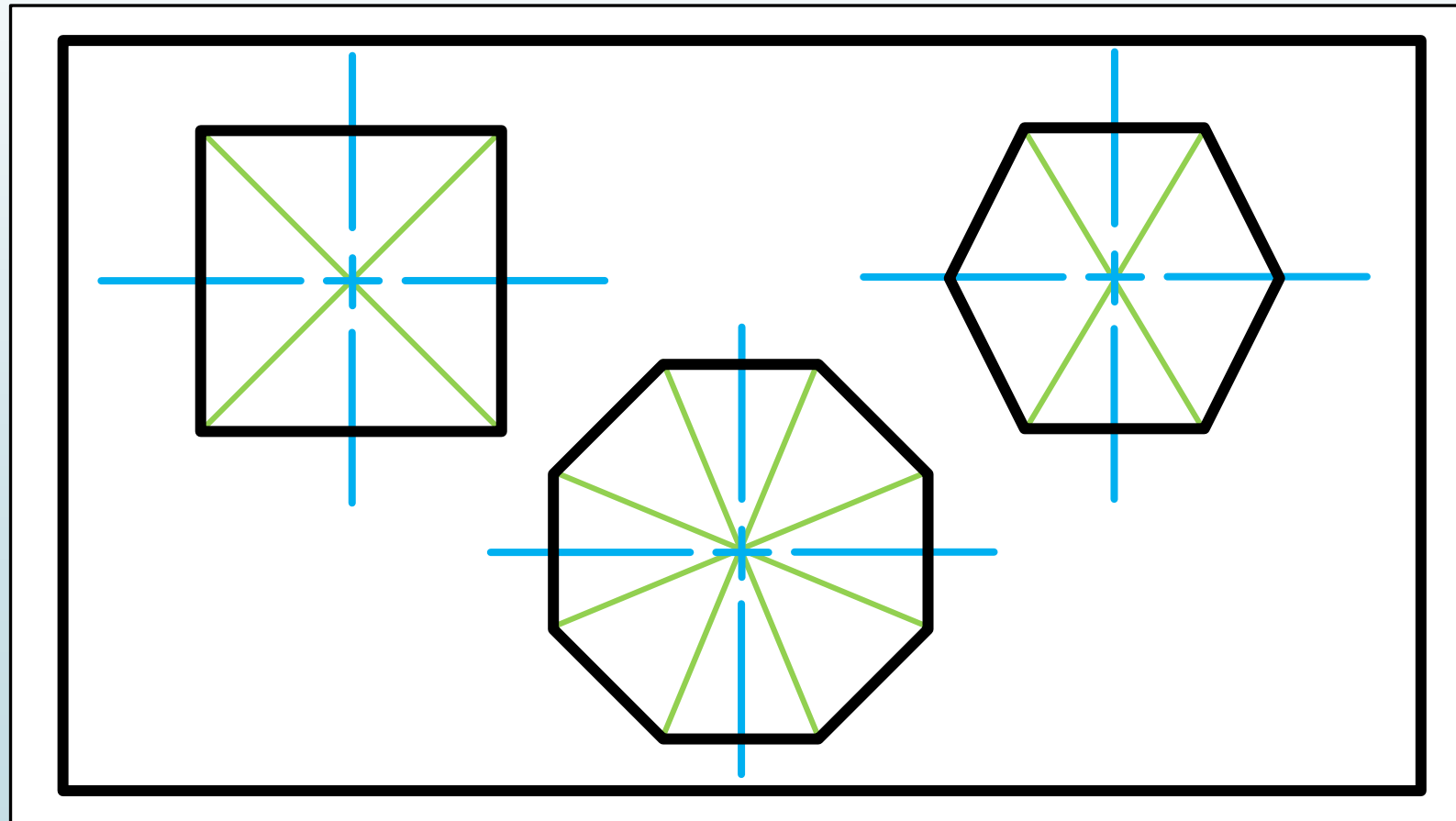
# Determine the centre of a polygon

- Polygons with uneven sides
- Bisecting the angle



# Determine the centre of a polygon

- Polygons with even sides
- Join the opposite corners



# Interpenetration standard question

## Question 2: Interpenetration

### Given:

- The incomplete front view and top view of an equilateral triangular prism that has to fit around a square prism. The axes of both prisms lie in a common vertical plane
- An auxiliary view of the triangular prism

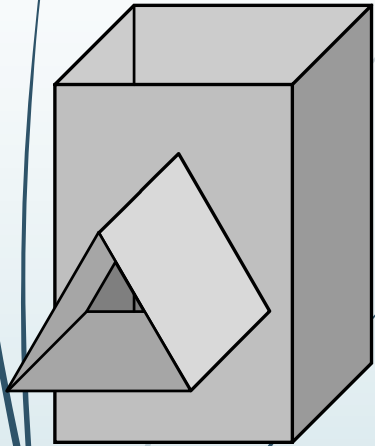
### Instructions:

Draw, to scale 1:1, the following:

1. The given top view
  2. The complete front view clearly showing the curve of interpenetration
  3. The complete right/left view
- Show ALL hidden detail
  - Shw ALL necessary construction.



# What is interpenetrations?



## Question 2: Interpenetration

### Given:

\* The incomplete front view and top view of an equilateral triangular prism that has to fit around a square prism. The axes of both prisms lie in a common vertical plane

\* An auxiliary view of the triangular prism

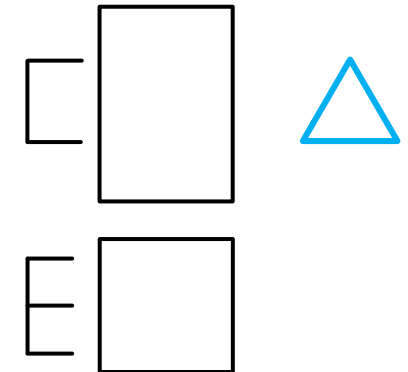
### Instructions:

Draw, to scale 1:1, the following:

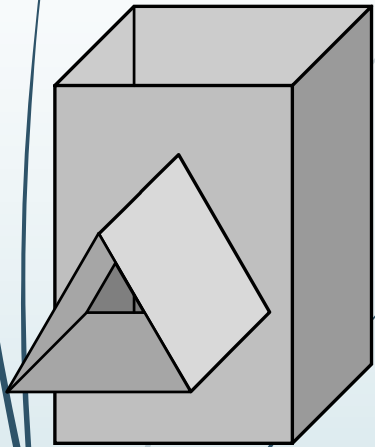
1. The given top view
2. The complete front view clearly showing the curve of interpenetration
1. The complete left view

\* Show ALL hidden detail

\* Show ALL necessary construction.



# What is interpenetrations?



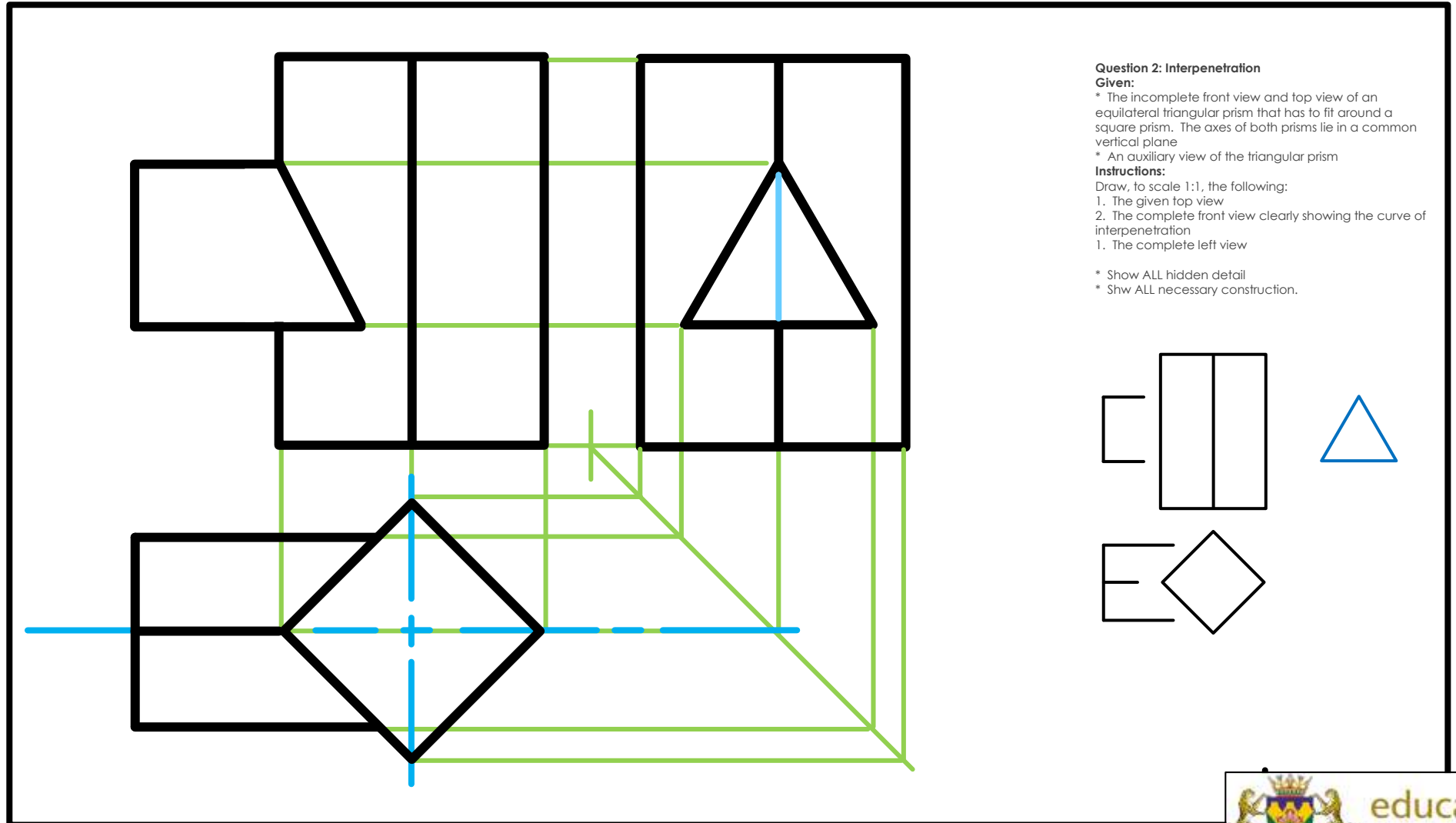
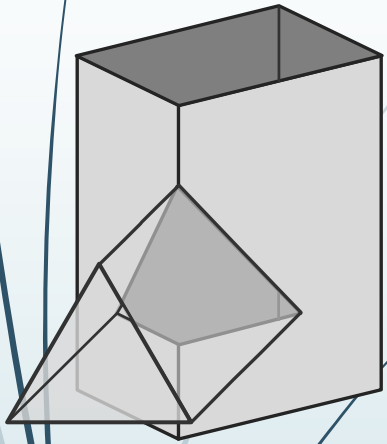
The diagram shows the orthographic projection of the interpenetrating prisms. It includes a top view (a square with an inscribed triangle), a front view (a square with a triangle on top), and a left view (a square with a triangle on the left). Green construction lines show the projection of the hidden lines and the curve of interpenetration. The top view shows the square prism's outline and the triangular prism's base. The front view shows the square prism's front face and the triangular prism's top face. The left view shows the square prism's left face and the triangular prism's side face. The curve of interpenetration is shown as a dashed line in the front view and a solid line in the left view.

**Question 2: Interpenetration**  
**Given:**  
\* The incomplete front view and top view of an equilateral triangular prism that has to fit around a square prism. The axes of both prisms lie in a common vertical plane  
\* An auxiliary view of the triangular prism  
**Instructions:**  
Draw, to scale 1:1, the following:  
1. The given top view  
2. The complete front view clearly showing the curve of interpenetration  
1. The complete left view  
  
\* Show ALL hidden detail  
\* Show ALL necessary construction.

The auxiliary views show the triangular prism's top view (a triangle) and its front view (a rectangle with a triangle on top). The top view is a blue triangle, and the front view is a black rectangle with a black triangle on top.



# What is interpenetrations?



## Question 2: Interpenetration

### Given:

\* The incomplete front view and top view of an equilateral triangular prism that has to fit around a square prism. The axes of both prisms lie in a common vertical plane

\* An auxiliary view of the triangular prism

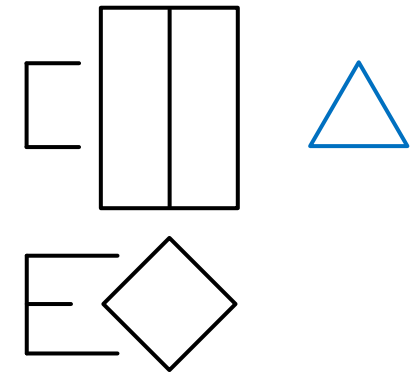
### Instructions:

Draw, to scale 1:1, the following:

1. The given top view
2. The complete front view clearly showing the curve of interpenetration
1. The complete left view

\* Show ALL hidden detail

\* Show ALL necessary construction.

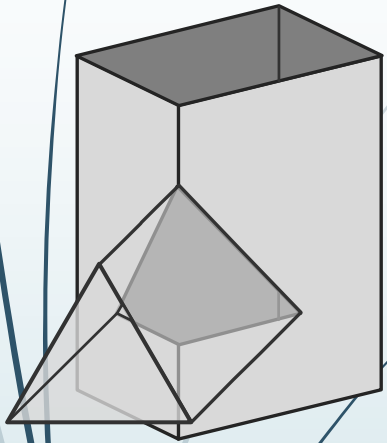


education

Department of  
Education  
FREE STATE PROVINCE

# What is interpenetrations?

Grade 11 content:  
The curves of interpenetration  
have to be symmetrical.

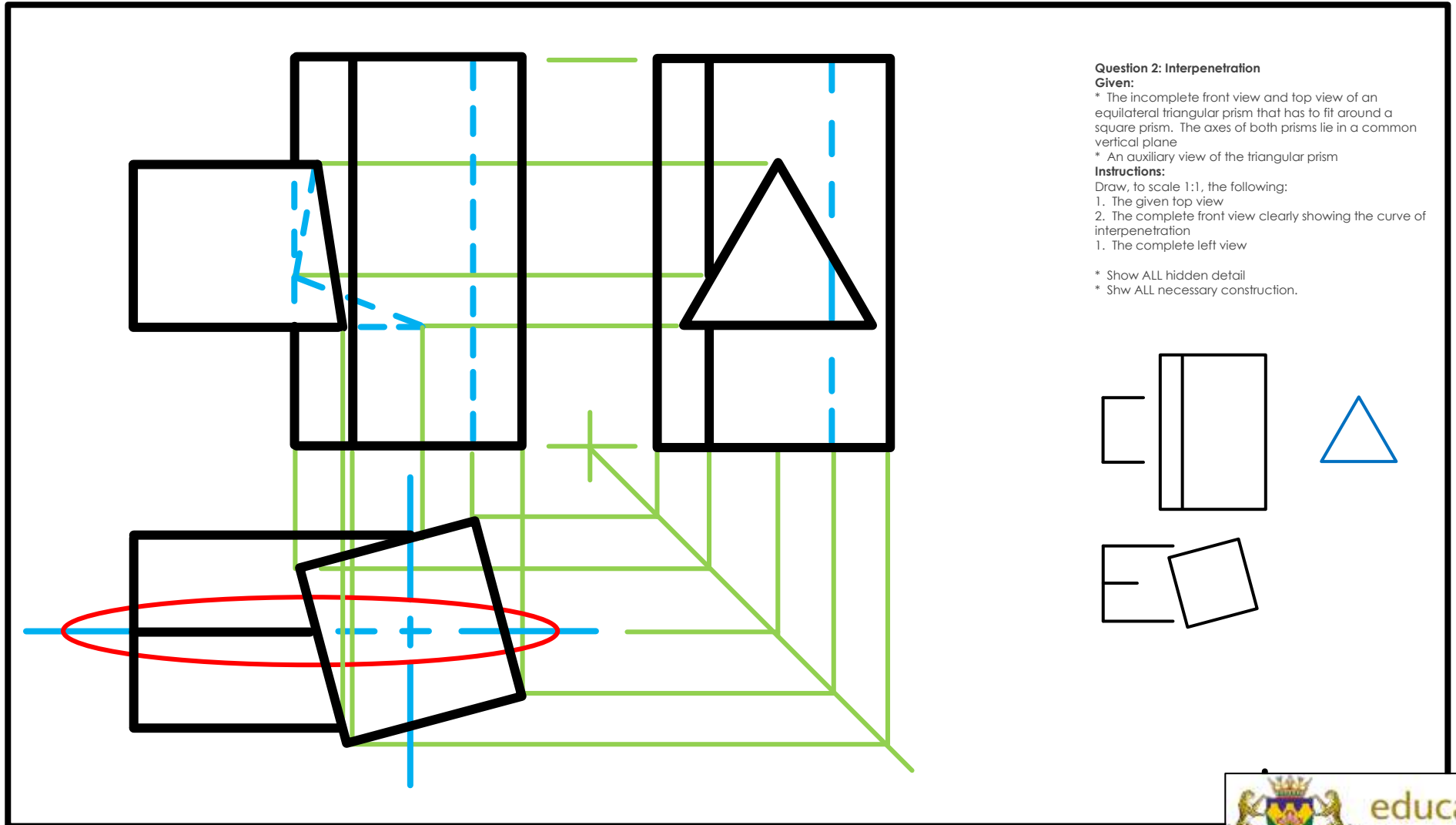
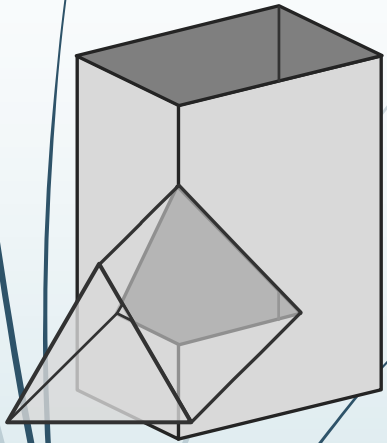


**Question 2: Interpenetration**  
**Given:**  
\* The incomplete front view and top view of an equilateral triangular prism that has to fit around a square prism. The axes of both prisms lie in a common vertical plane  
\* An auxiliary view of the triangular prism  
**Instructions:**  
Draw, to scale 1:1, the following:  
1. The given top view  
2. The complete front view clearly showing the curve of interpenetration  
1. The complete left view  
  
\* Show ALL hidden detail  
\* Show ALL necessary construction.



# What is interpenetrations?

Grade 12 content:  
The curves of interpenetration  
can be non-symmetrical.



### Question 2: Interpenetration

#### Given:

\* The incomplete front view and top view of an equilateral triangular prism that has to fit around a square prism. The axes of both prisms lie in a common vertical plane

\* An auxiliary view of the triangular prism

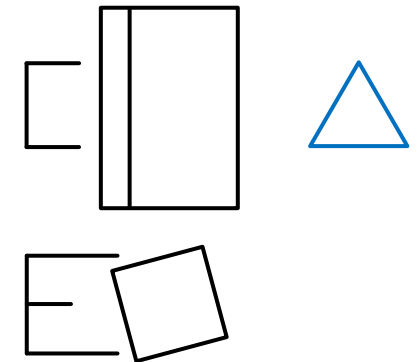
#### Instructions:

Draw, to scale 1:1, the following:

1. The given top view
2. The complete front view clearly showing the curve of interpenetration
1. The complete left view

\* Show ALL hidden detail

\* Show ALL necessary construction.



education

Department of  
Education  
FREE STATE PROVINCE