ENGINEERING DRAWING

Prepared by
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2024 - 2025

LECTURE 4

- **Inclined Surfaces in Isometric**
- **Circles and Arcs in an Isometric**

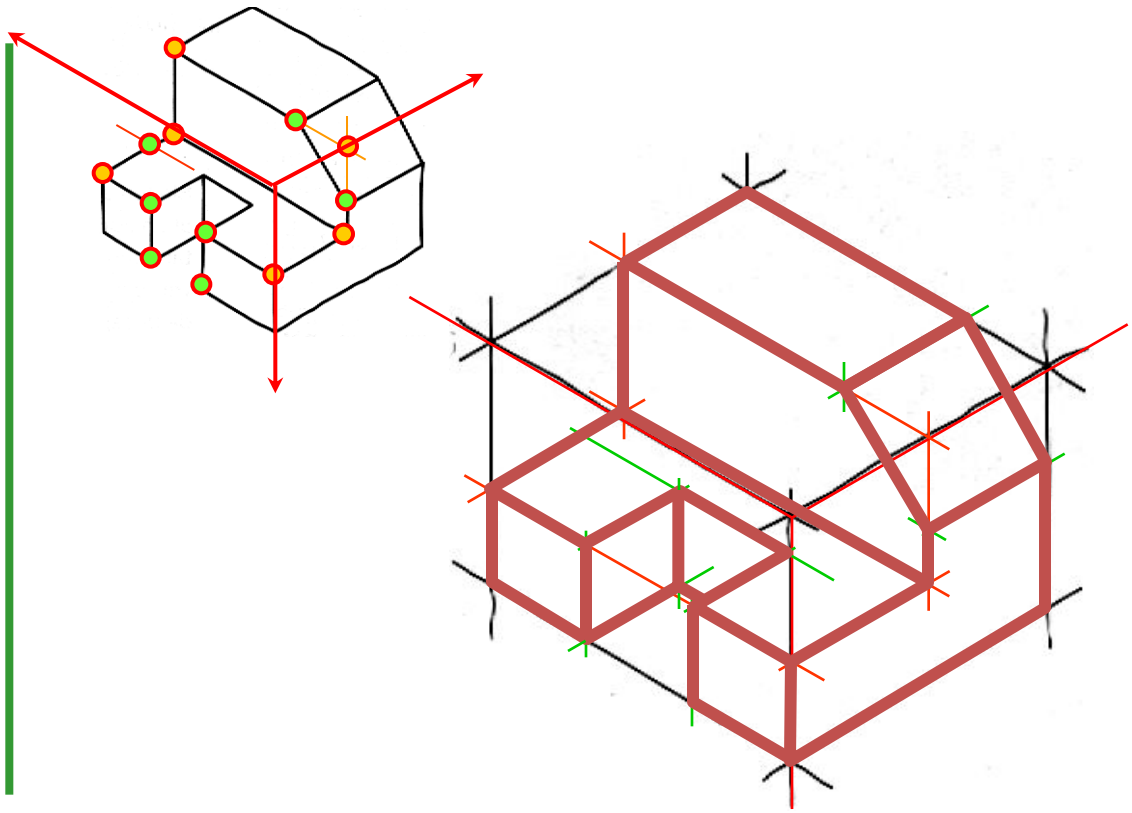
Inclined Surfaces in Isometric

رسم الأسطح المائلة فى المنظور الهندسى

Sketch from an actual object

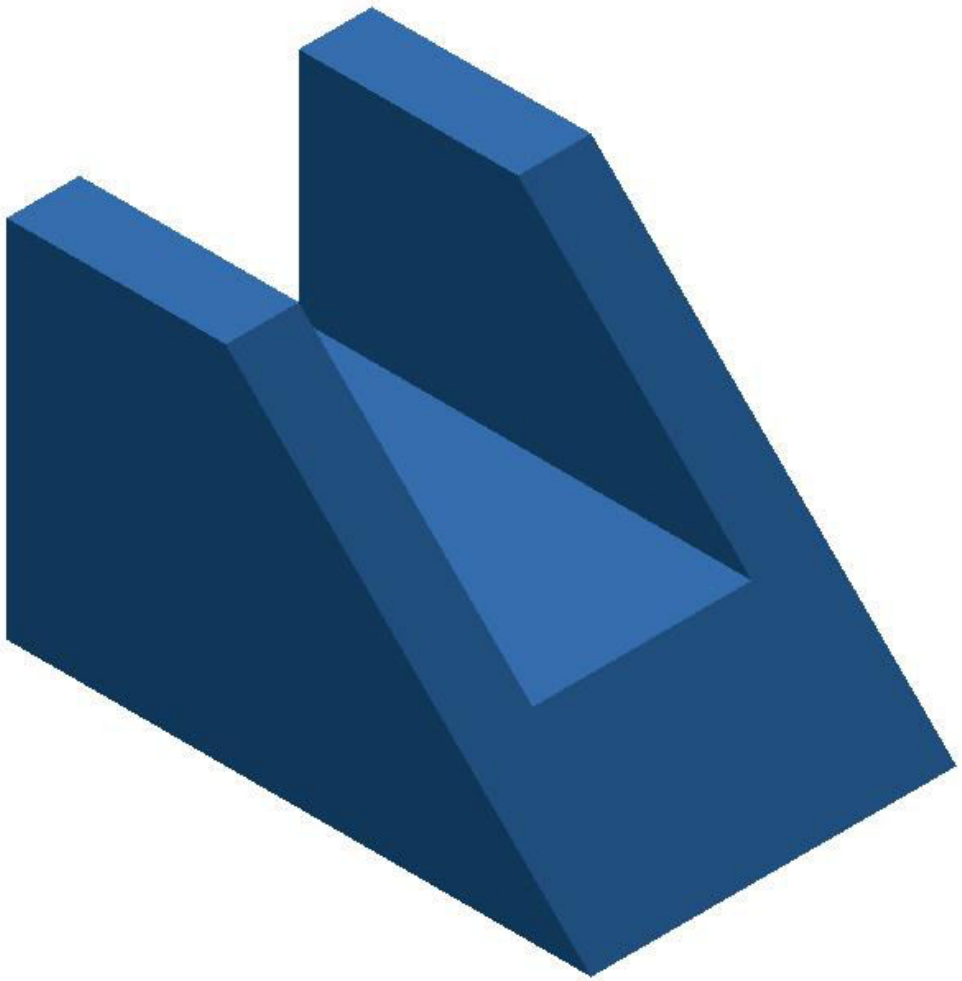
STEPS:

1. Positioning object.
2. Select isometric axis.
3. Sketch enclosing box.
4. Add details.
5. Darken visible lines.

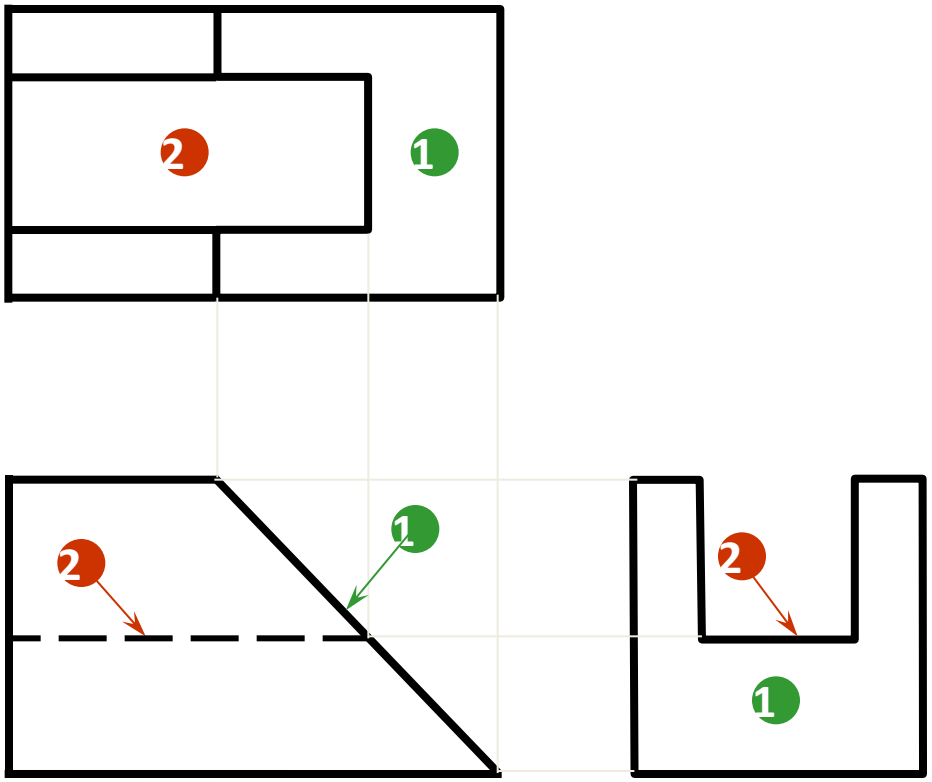


Note In isometric sketch/drawing), hidden lines are *omitted* unless they are absolutely necessary to completely describe the object.

Example 1



Example 1 (1/3)



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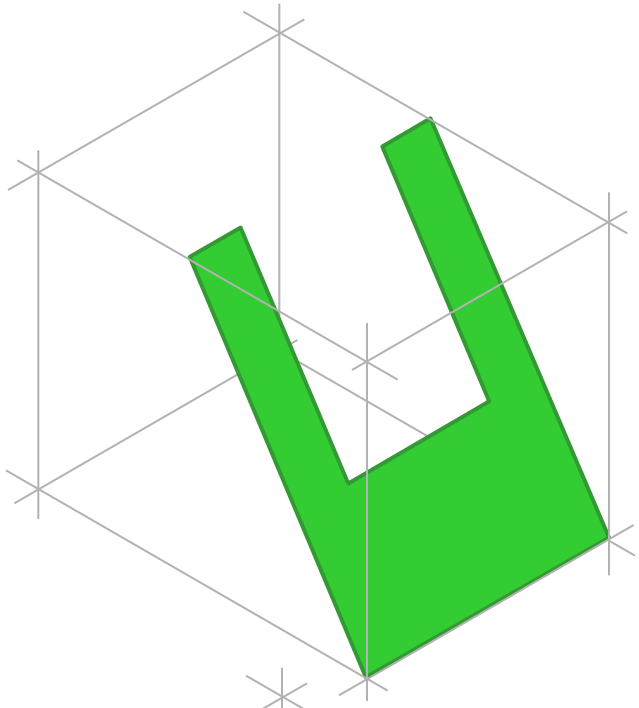

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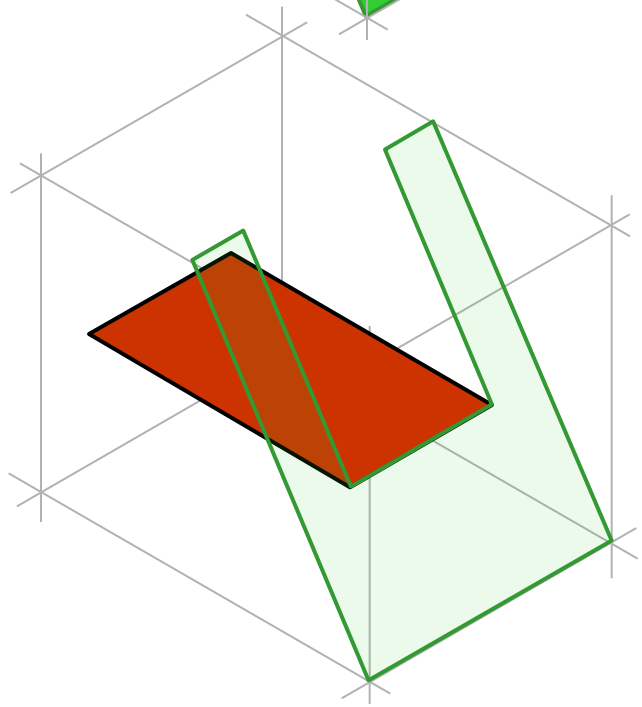
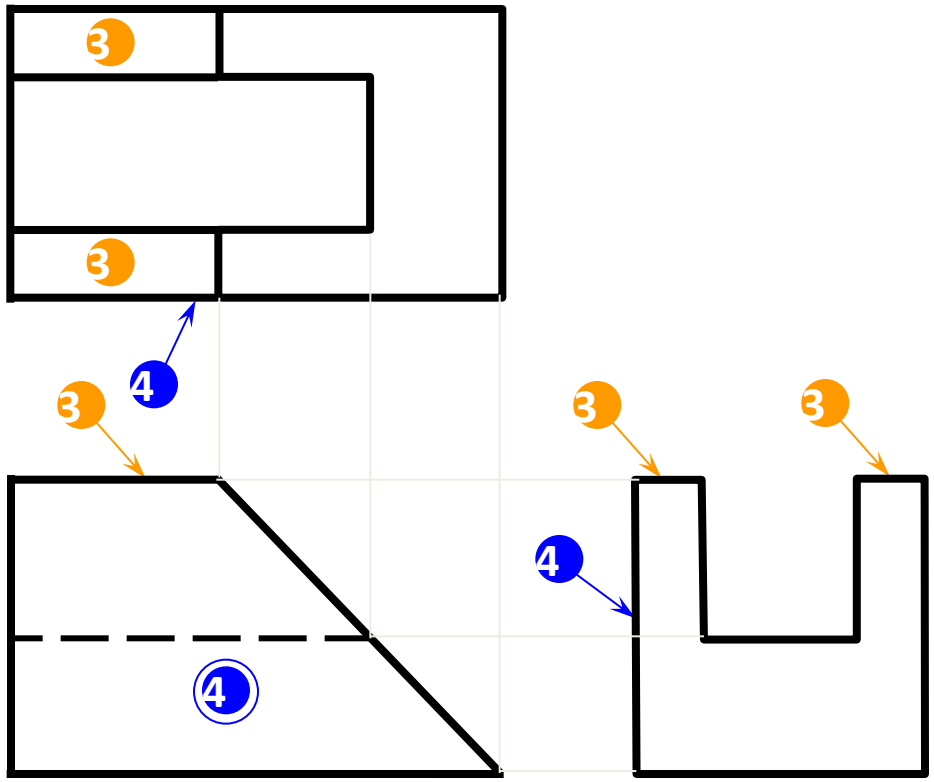
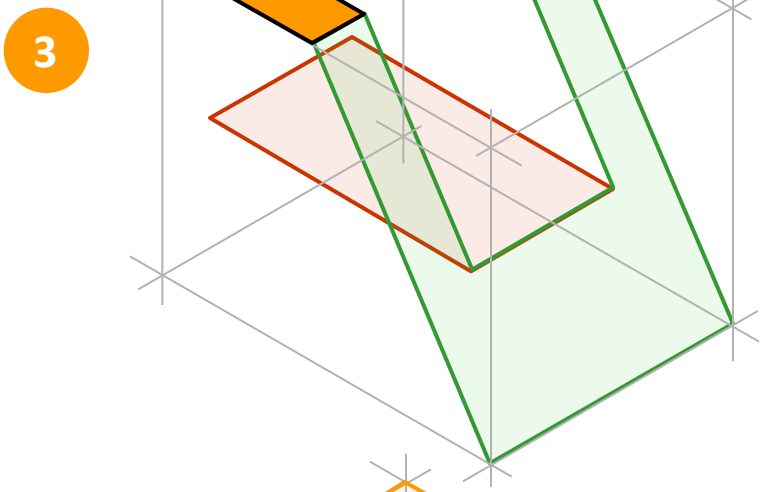
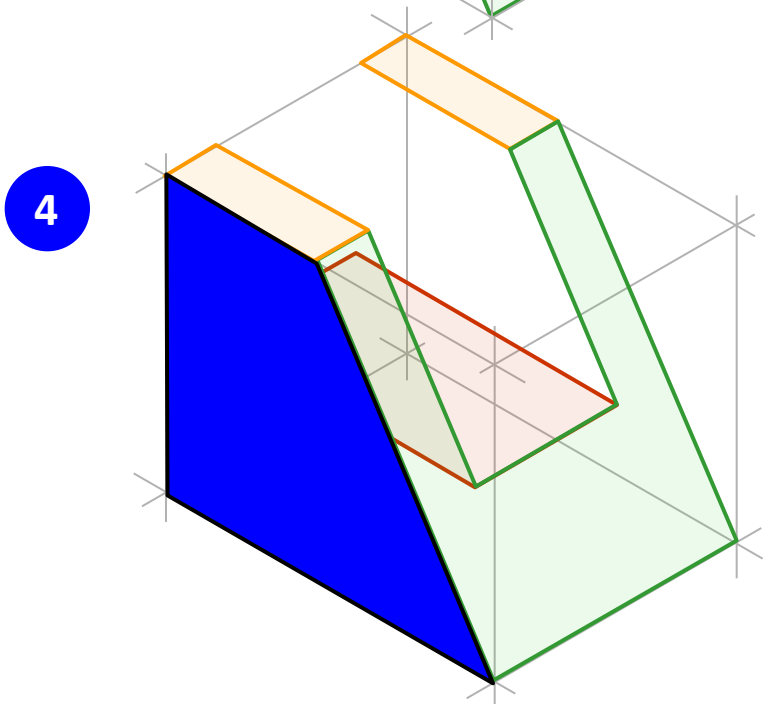


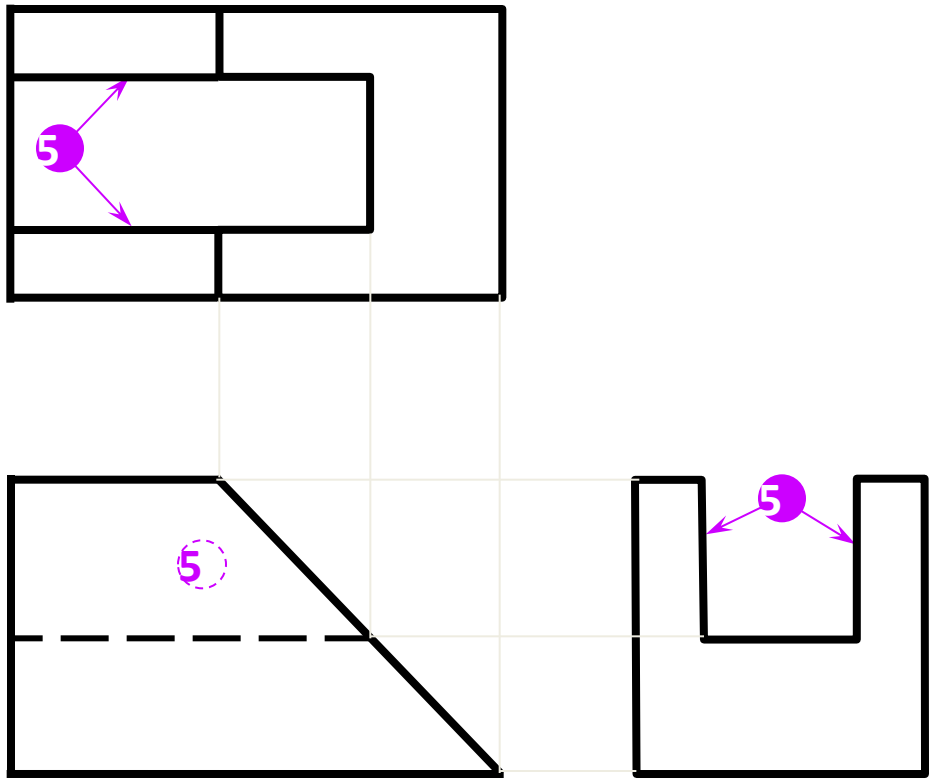
Example 1 (2/3)

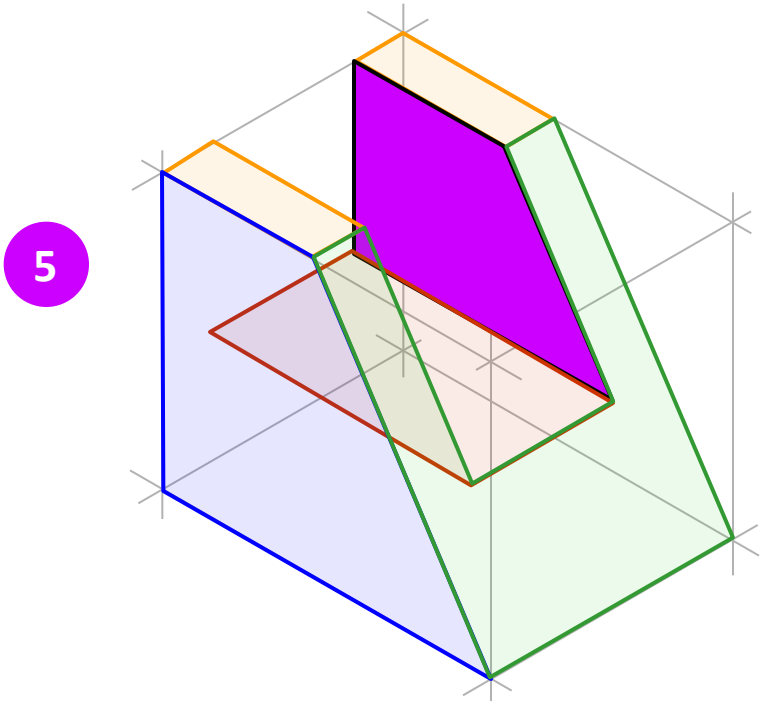




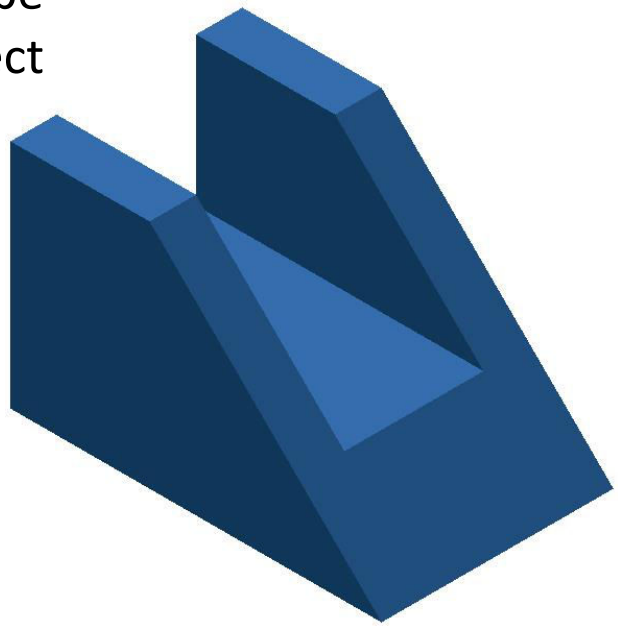


Example 1 (3/3)

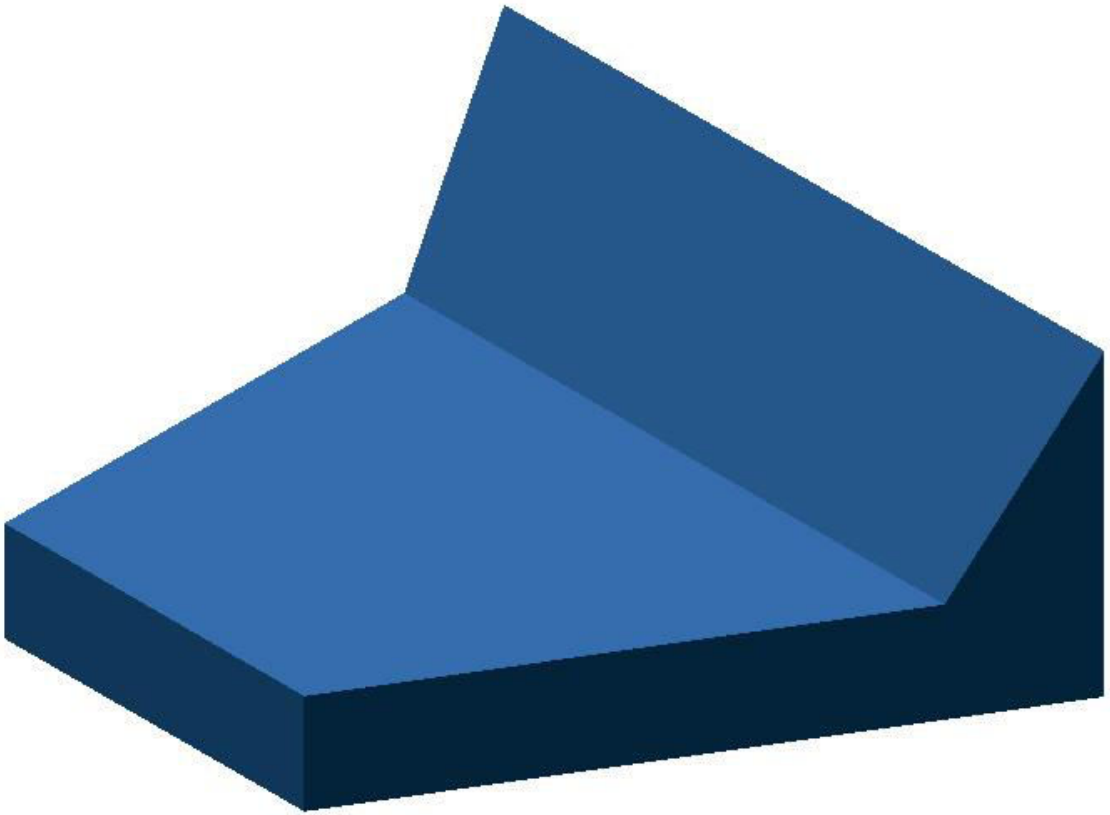


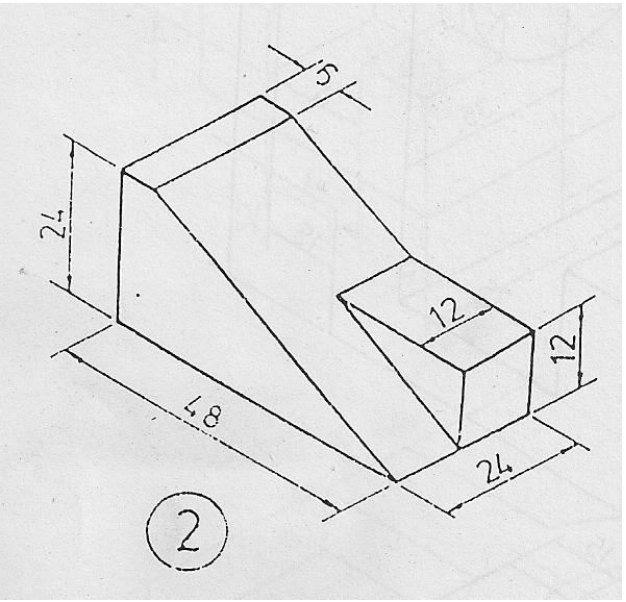


Final shape of an object



Example 2

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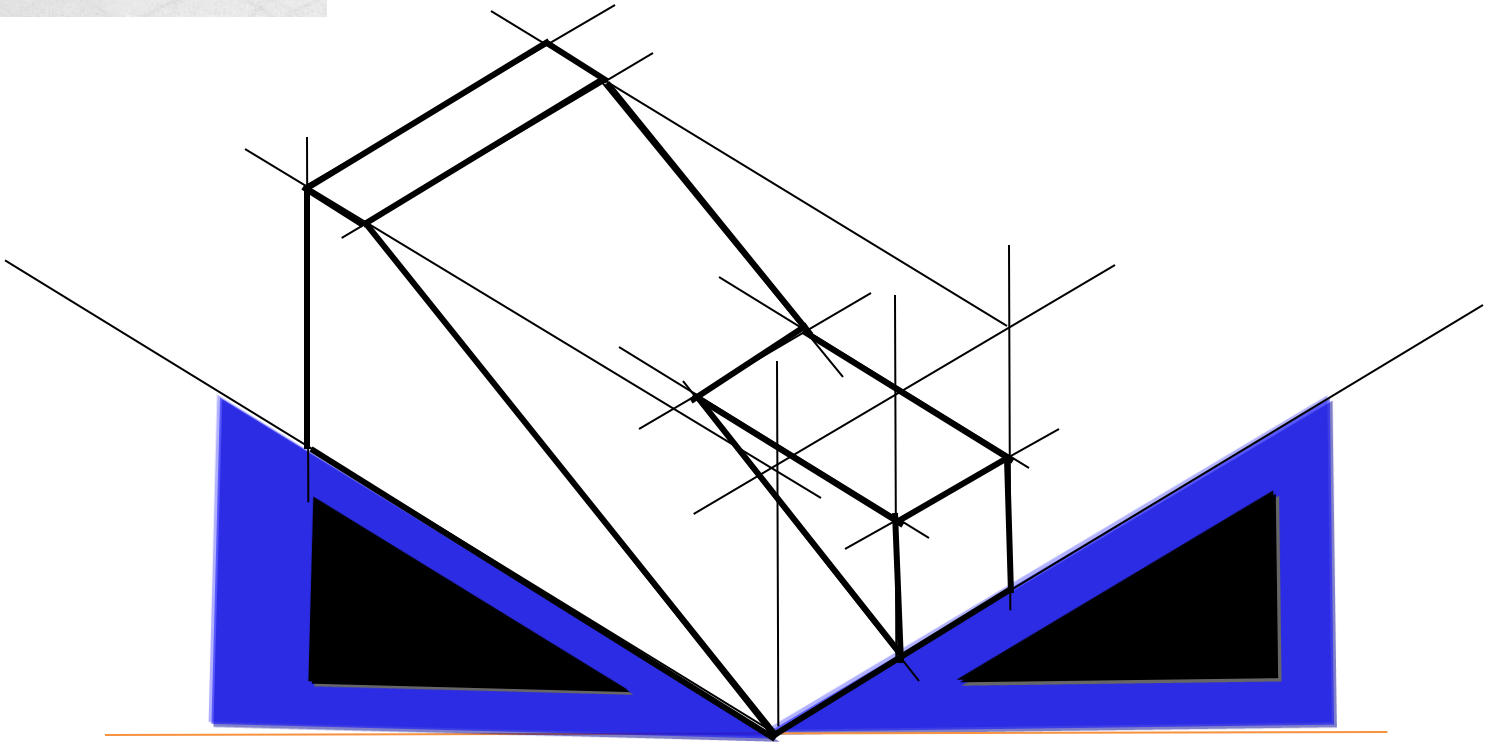


Circles and Arcs in an Isometric

رسم الدوائر والأقواس
فى المنظور الهندسى

Sketching circles and arcs in an isometric (appeared on the normal plane)

رسم الدوائر والأقواس فى المنظور

1. Circles appear as ellipse in an isometric sketch.

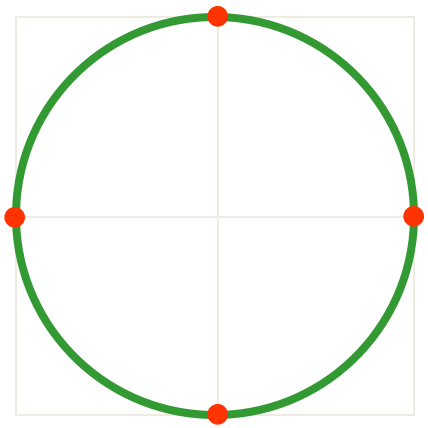
تظهر الدوائر بيضاوية فى المنظور

2. In case of isometric sketch, the ellipse is called "*isometric ellipse*

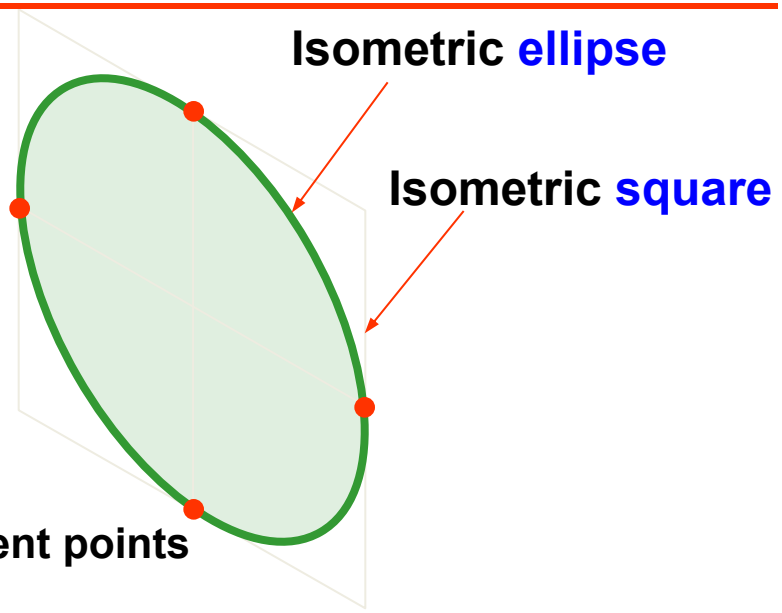
ويسمى البيضاوى (بيضاوى منظورى)

3. The square that circumscribes an isometric ellipse is called "*isometric square*".

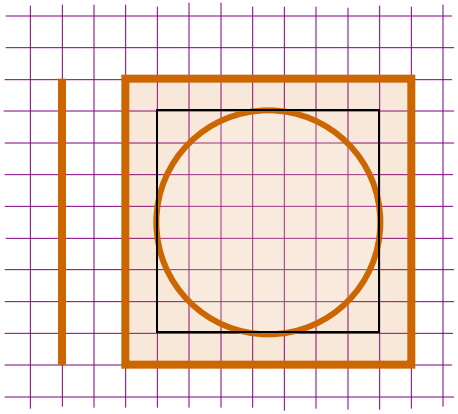
والمربع الذى يحتوى على البيضاوى المنظورى يسمى المربع المنظورى



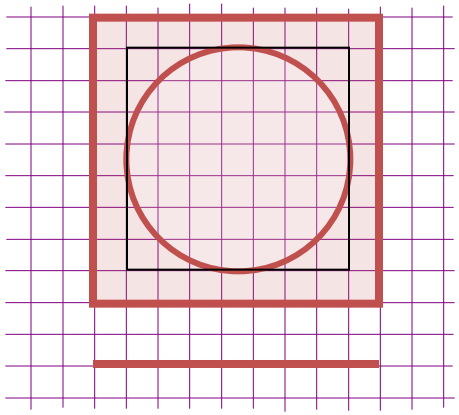
Tangent points



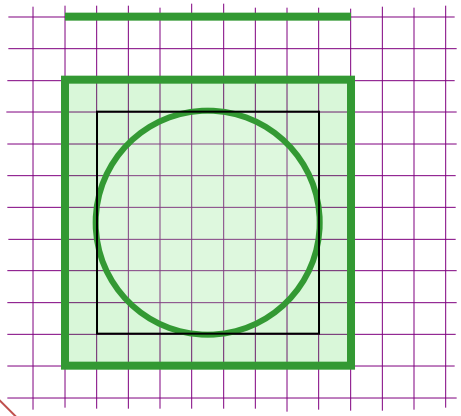
Orientation of Isometric ellipses



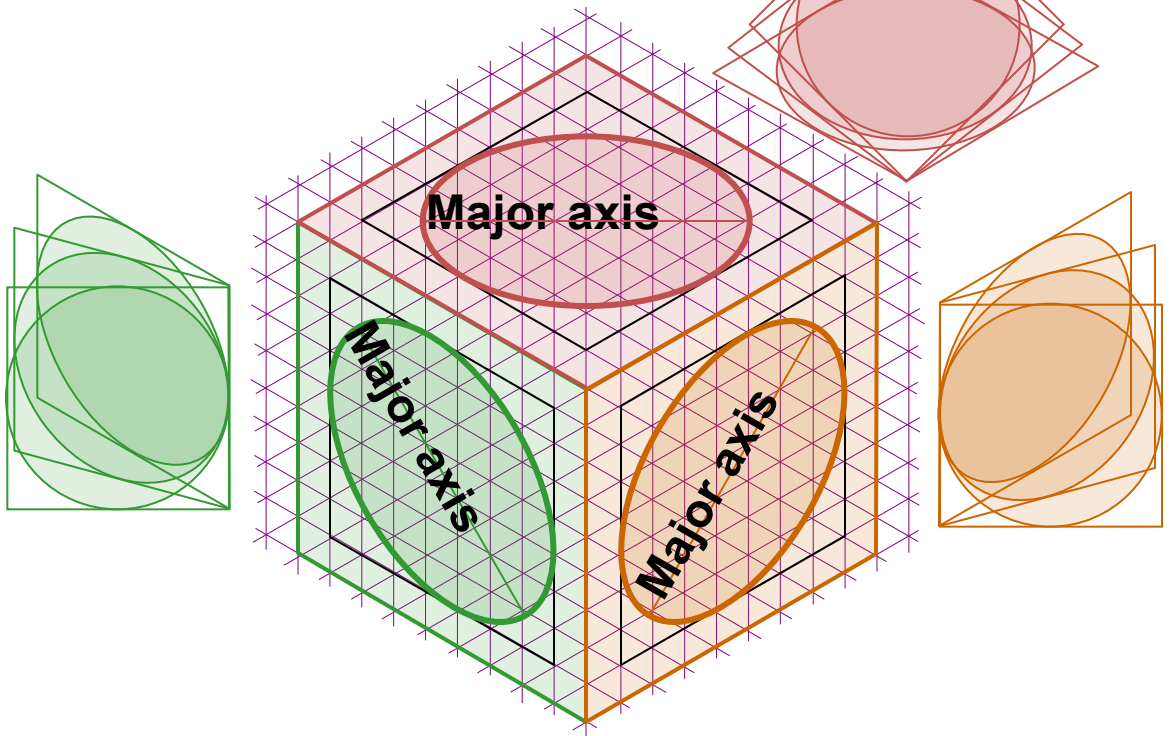
FRONT VIEW



TOP VIEW

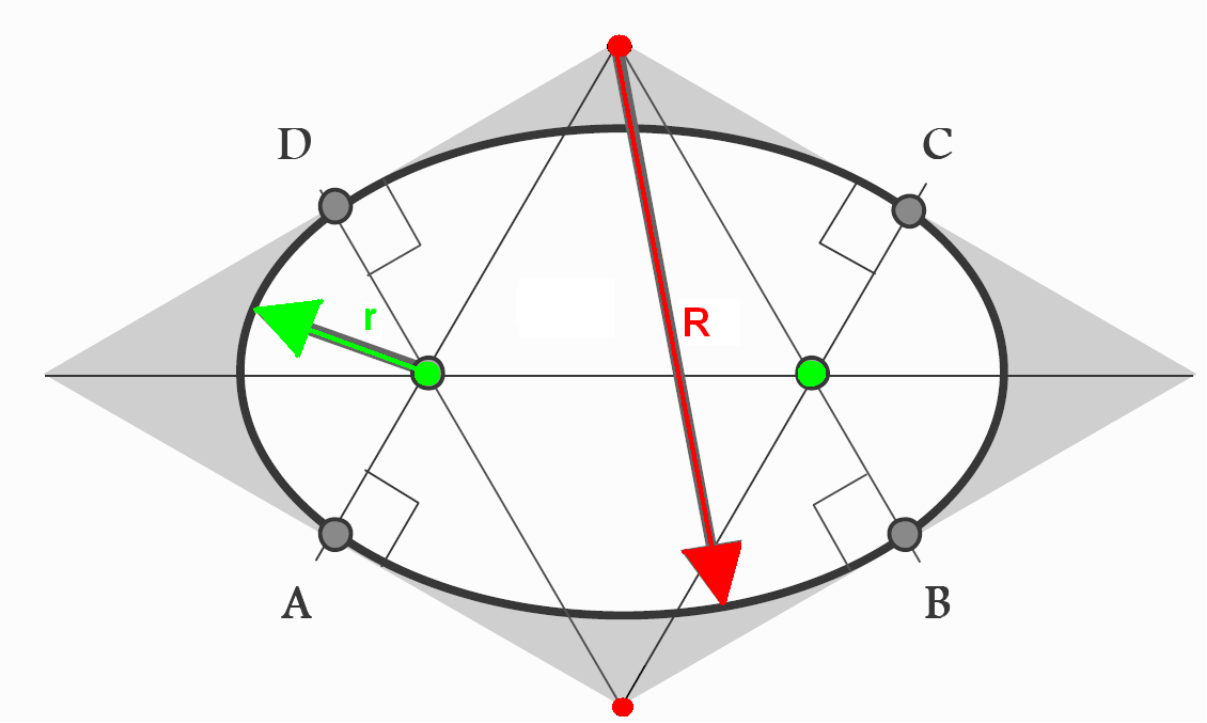


LEFT SIDE VIEW



THE FOUR CENTERS METHOD

طريقة الاربع مراكز



Drawing isometric ellipses
رسم البيضاويات المنظورية

STEPS FOR THE FOUR CENTERS METHOD
خطوات طريقة الأربع مراكز

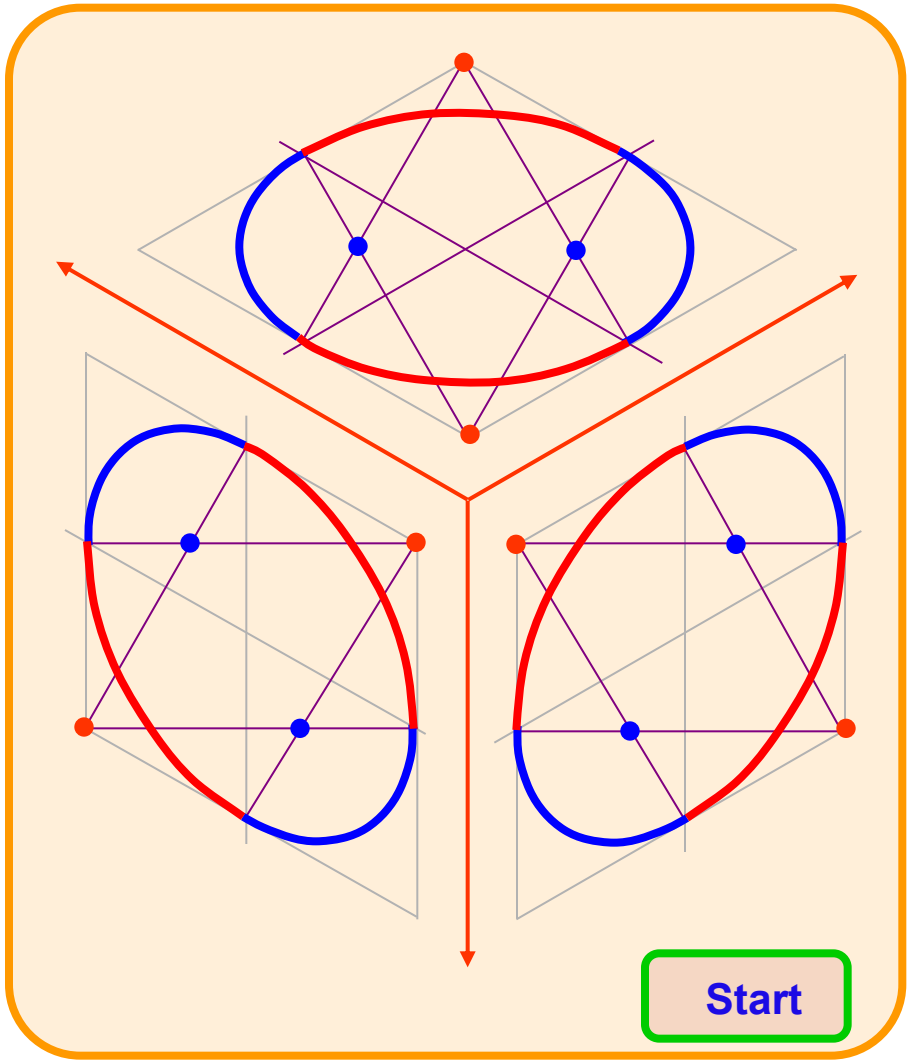
1. Locate the center of an ellipse.
حدد المركز برسم خطين ايزومتريين

2. Sketch an isometric square.
ارسم المربع الأيزومترى

3. Construct a perpendicular bisector from each tangent point.
ارسم منصفات متعامدة من نقاط التماس

4. Locate the four centers.
حدد الأربع مراكز

5. Draw the arcs with these centers and tangent to isometric square.
ارسم الأربعة اقواس المكونة للبيضاوى باستخدام الأربع مراكز والأربع نقاط تماس



Drawing isometric ellipses

رسم البيضاويات المنظورية

STEPS:

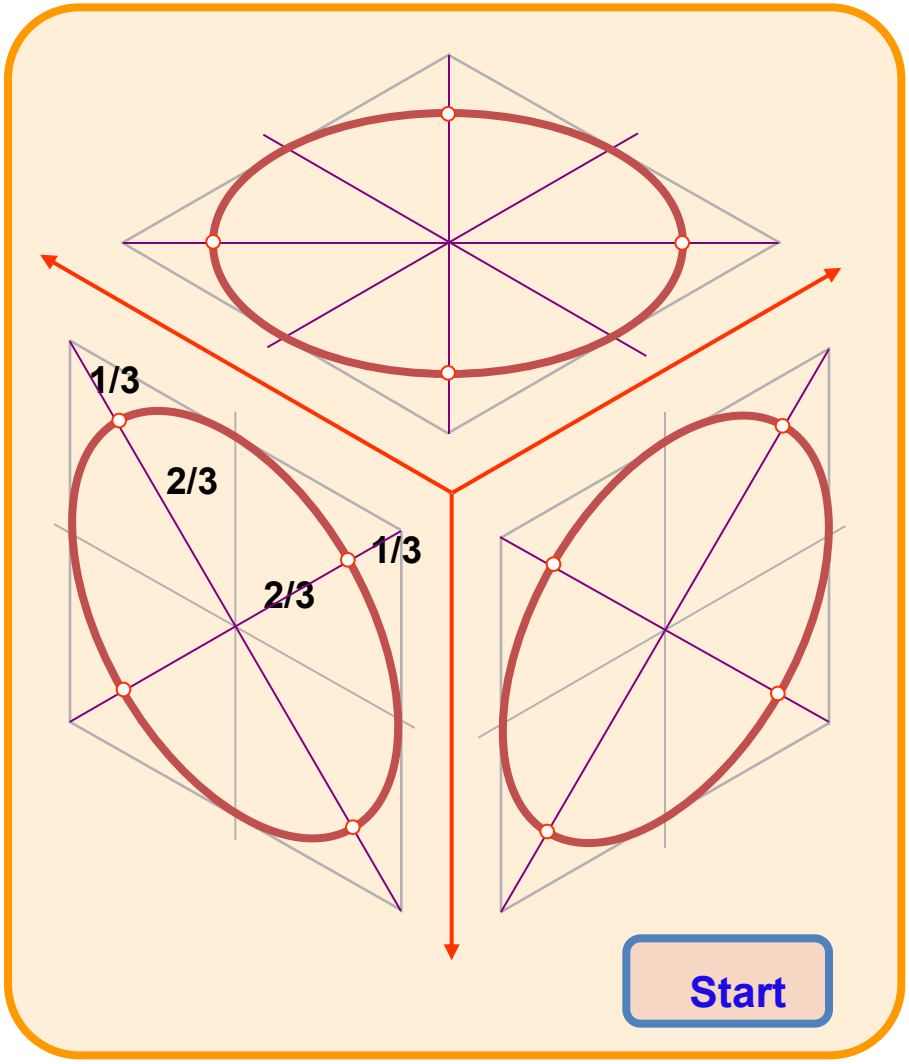
1. Locate the center of an ellipse by two isometric lines.
تحديد المركز باستخدام خطين أيزومترين

2. Sketch an isometric square.
ارسم المربع الأيزومترى

3. Sketch diagonal lines.
ارسم الأقطار الأعظم والأصغر

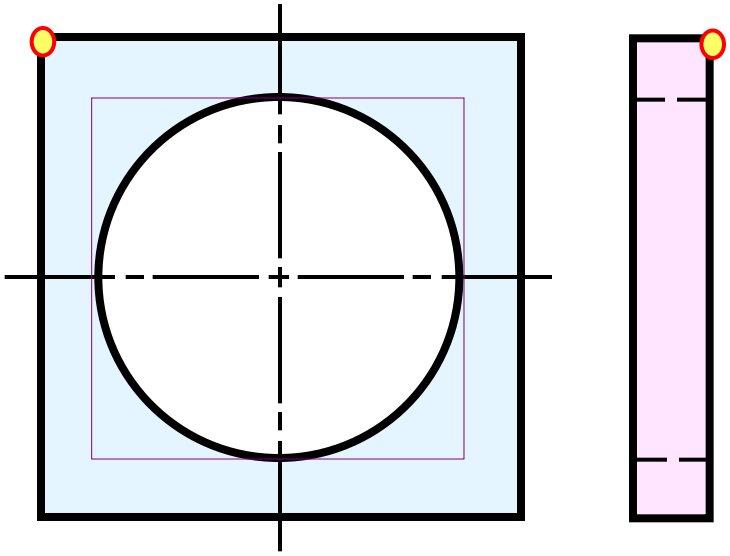
4. Mark the point on diagonal line far from the center of an ellipse for a distance 2/3 of the half-length of the line.
علم علامات على الأقطار تبعد ثلثى نصف طول القطر من مركز البيضاوى

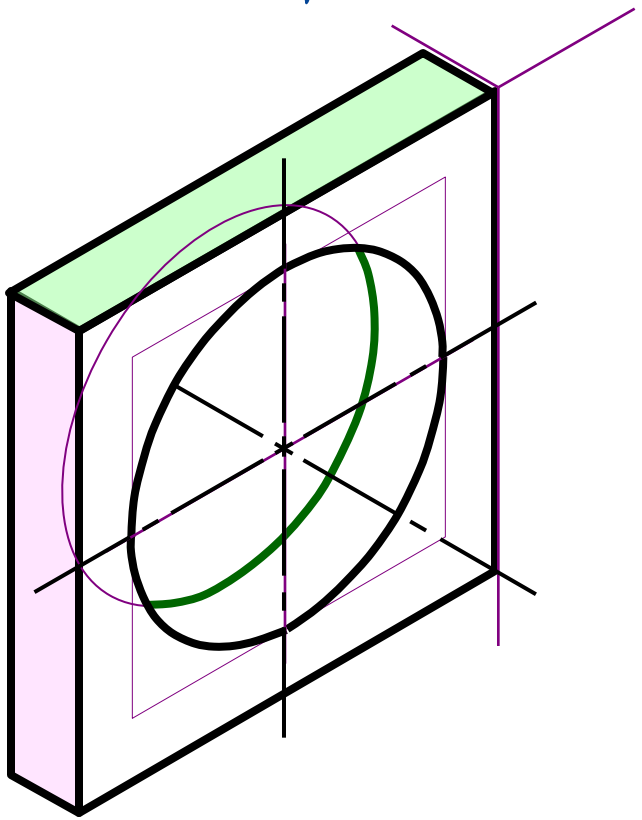
5. Draw the arcs through the marked and tangent points.
ارسم الأقواس بين العلامات ونقاط التماس



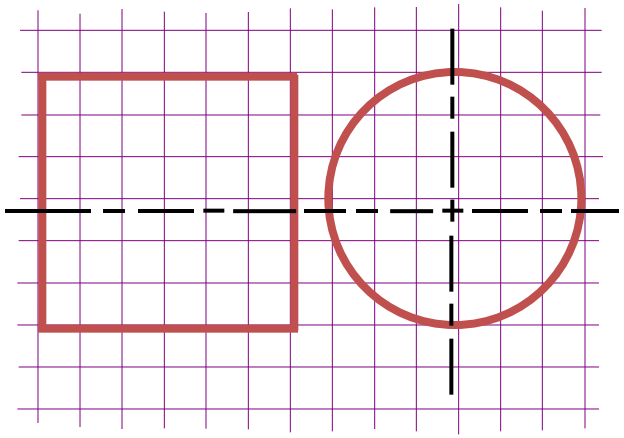
Drawing circular holes in an isometric (appeared on the normal plane)

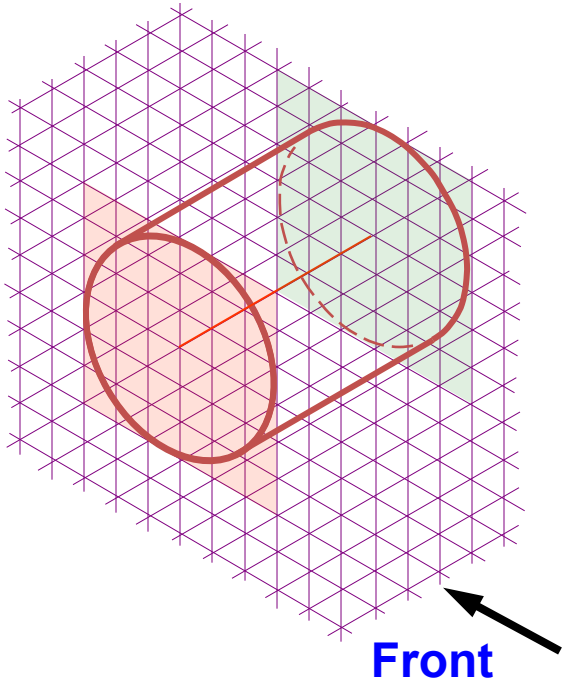
رسم الثقوب الدائرية فى المنظور



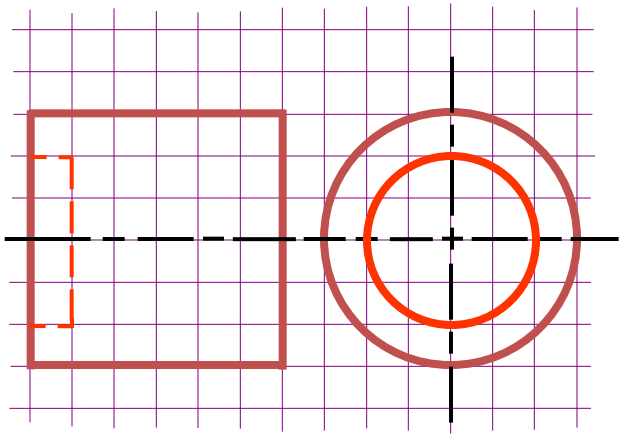


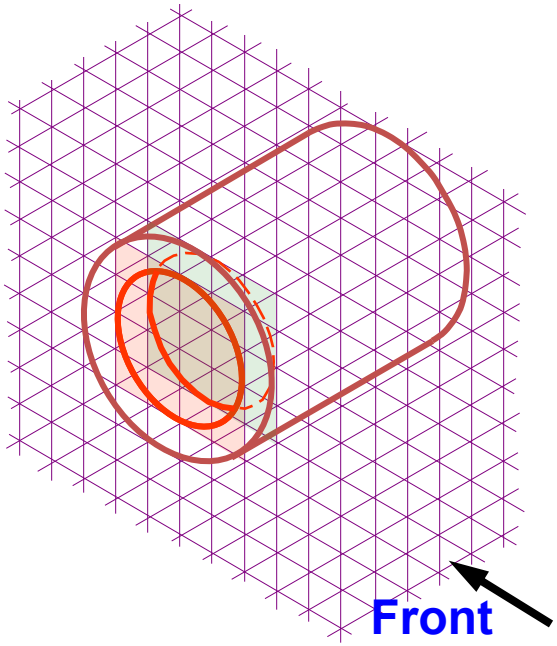
Drawing solid cylinders in an isometric

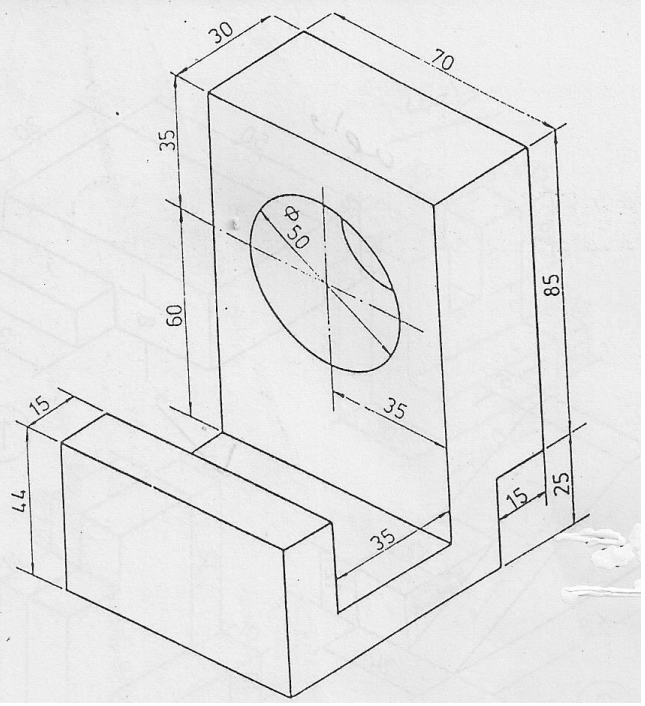




Drawing shallow cylinders in an isometric



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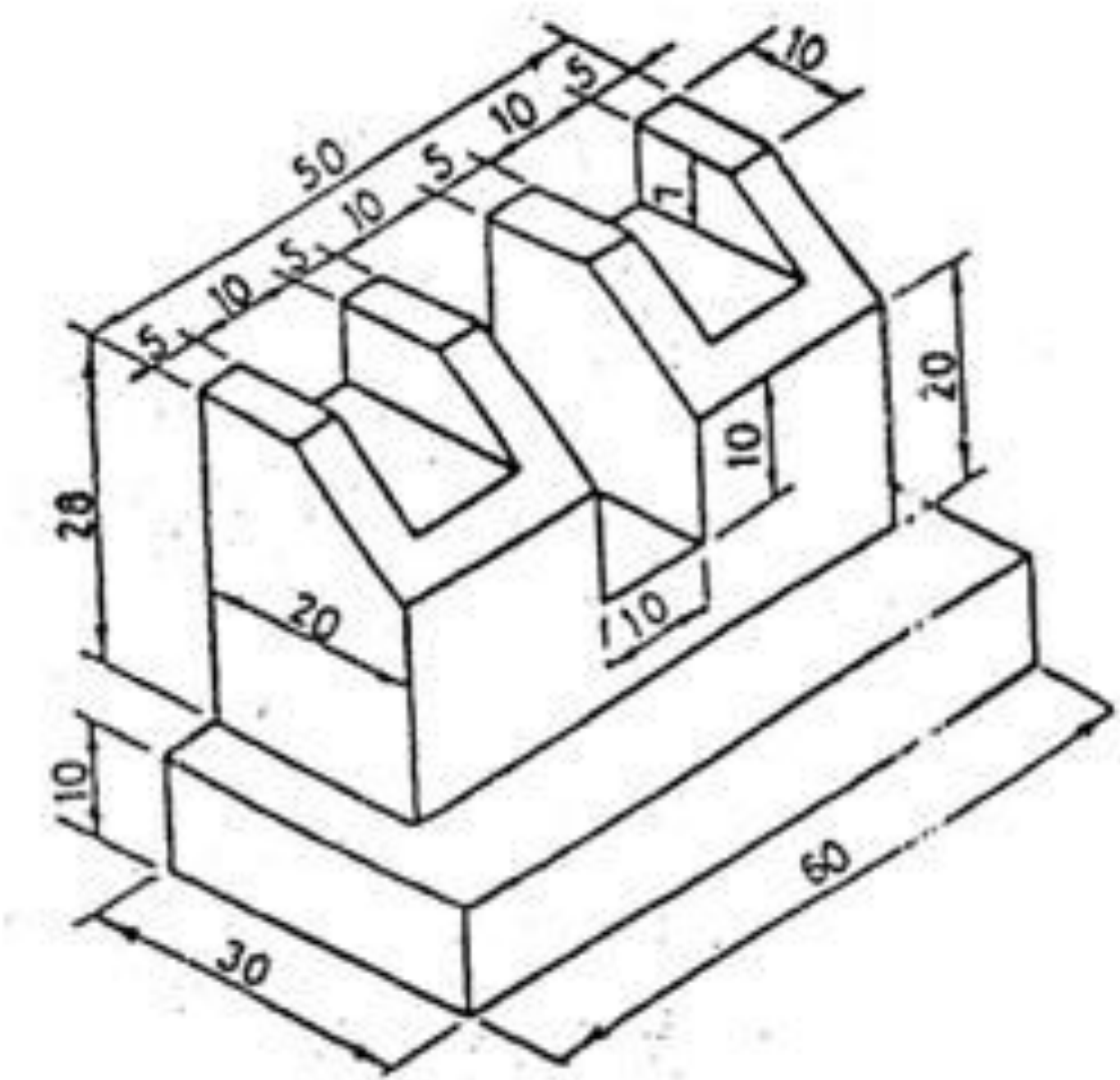
تمارين المحاضرة الرابعة

تمارين الصالة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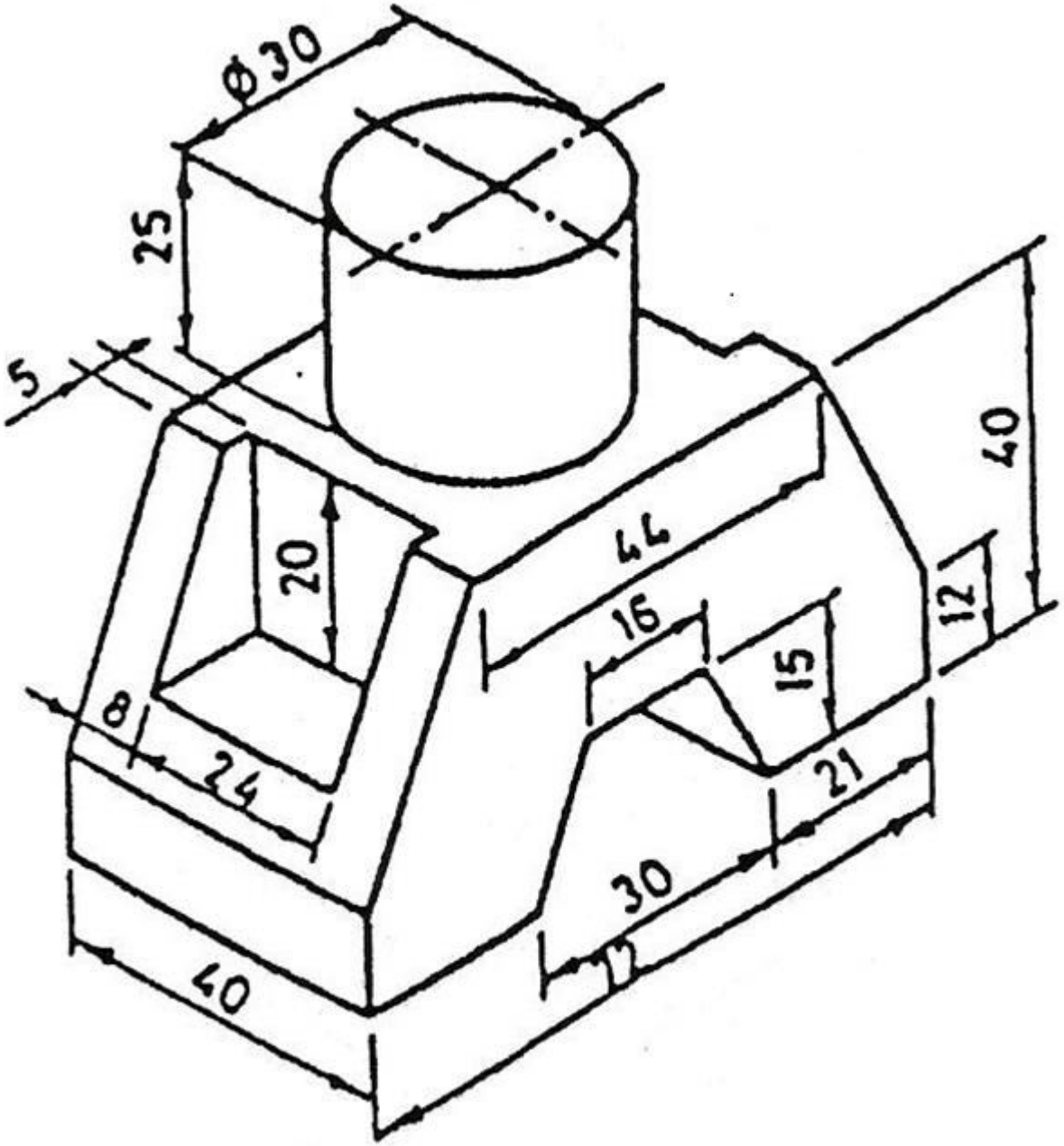
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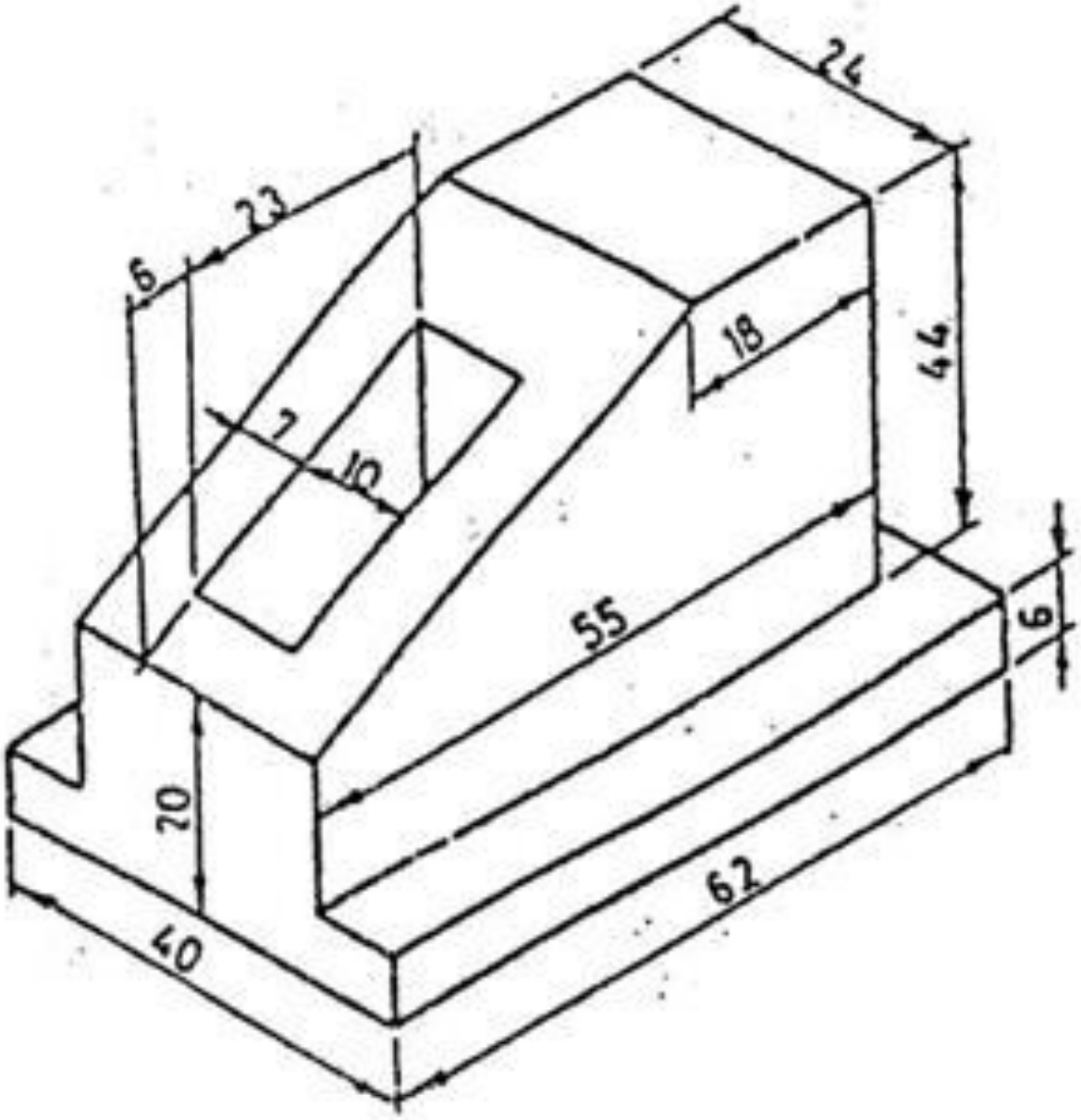
تمارين الواجب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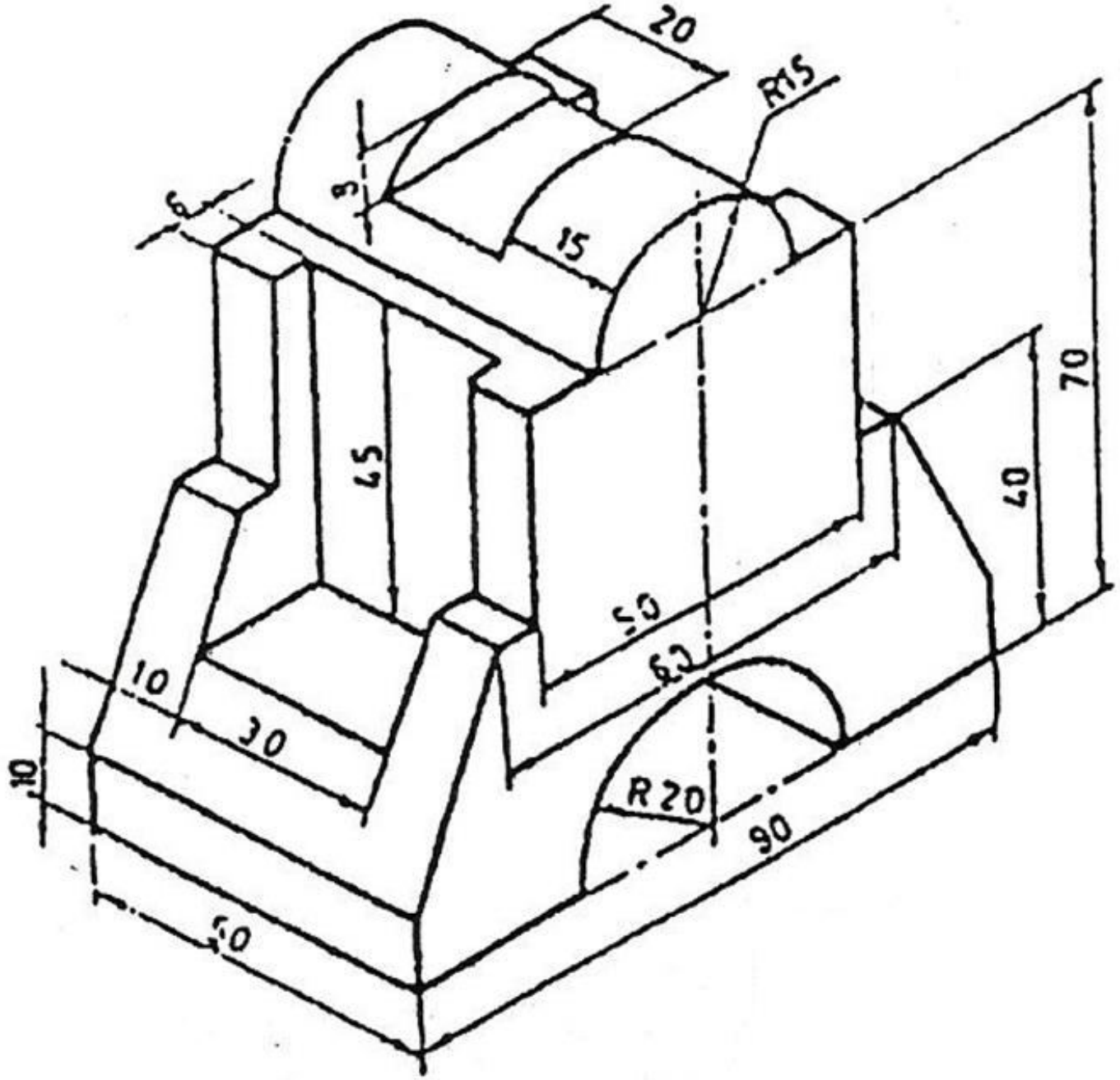
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End of Lecture 4