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Geometric Constructions

Topic : 5 , Mathematics II

Explain

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Construction of Similar triangle

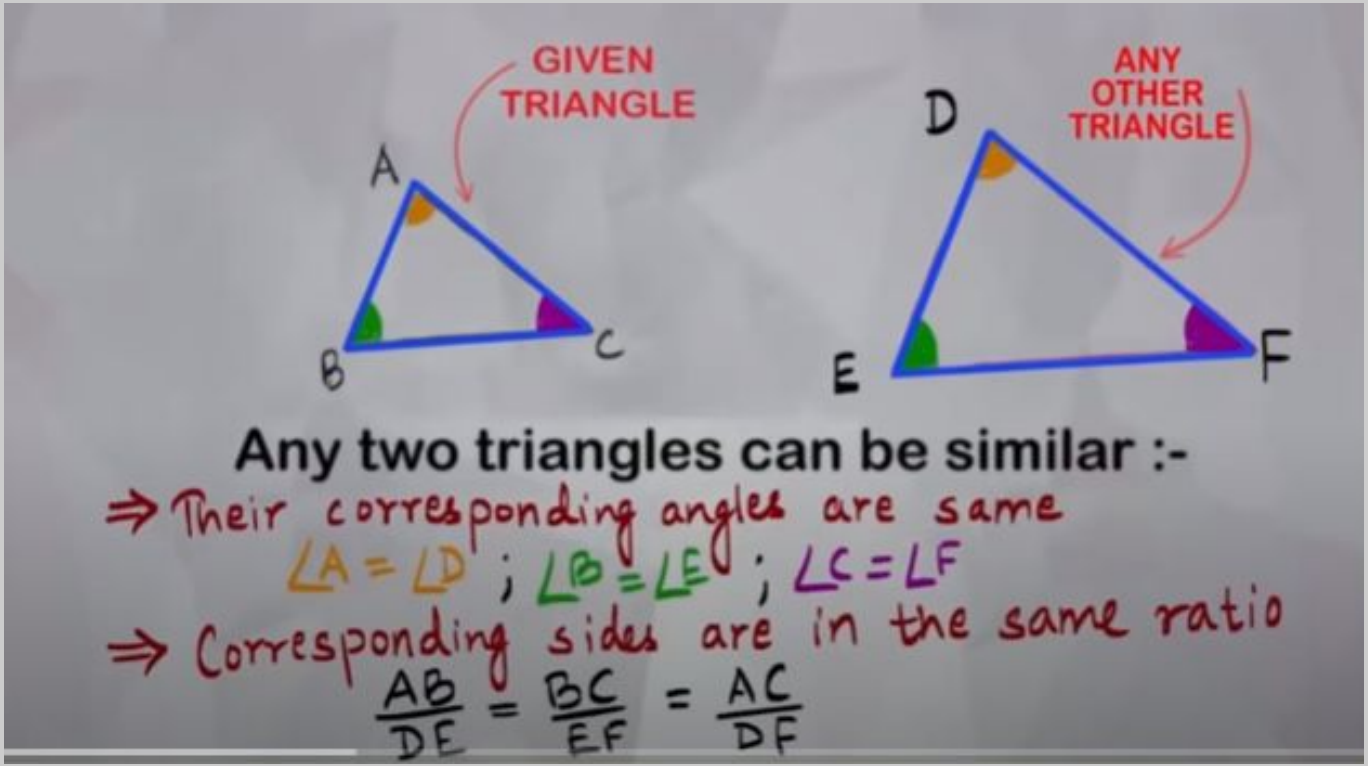
Similar triangle means ?

2 triangles whose sides have same proportion (means the sides of the triangles are of same ratio)

2 triangles whose corresponding angles are equal.

How do we construct similar triangles ?

Explain



Are △ ABC and △ DEF similar?

Yes, they are similar.

For more details, check this video

https://www.youtube.com/watch?v=vNCBBIfO0DI

Ex. (1)

△ ABC ~ △ PQR,

in △ ABC,

AB = 5.4 cm,

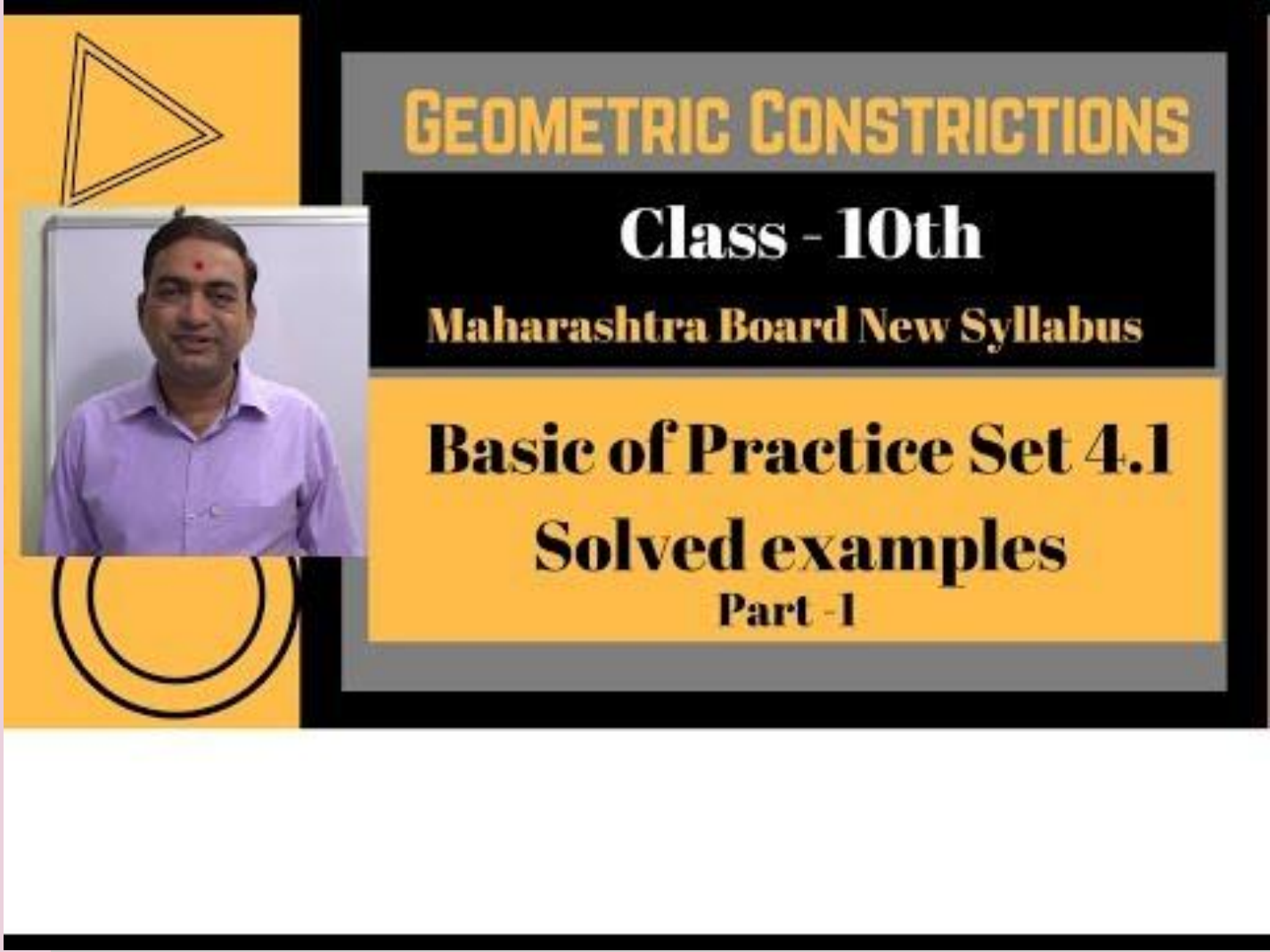
BC = 4.2 cm,

AC = 6.0 cm.

AB: PQ = 3:2.

Construct △ ABC and

△ PQR.



Explain

If the lengths of the sides that we get after calculating is not easily measurable by scale. How do we construct that triangle?

Ans : To divide the line segment into equal parts.

Ex: e, if length of side AB is 11.6/ 3 cm, then by dividing the line segment of length 11.6 cm in three equal parts, we can draw segment AB.

In the example given above, there was no common vertex between the similar triangles

How to construct similar triangles

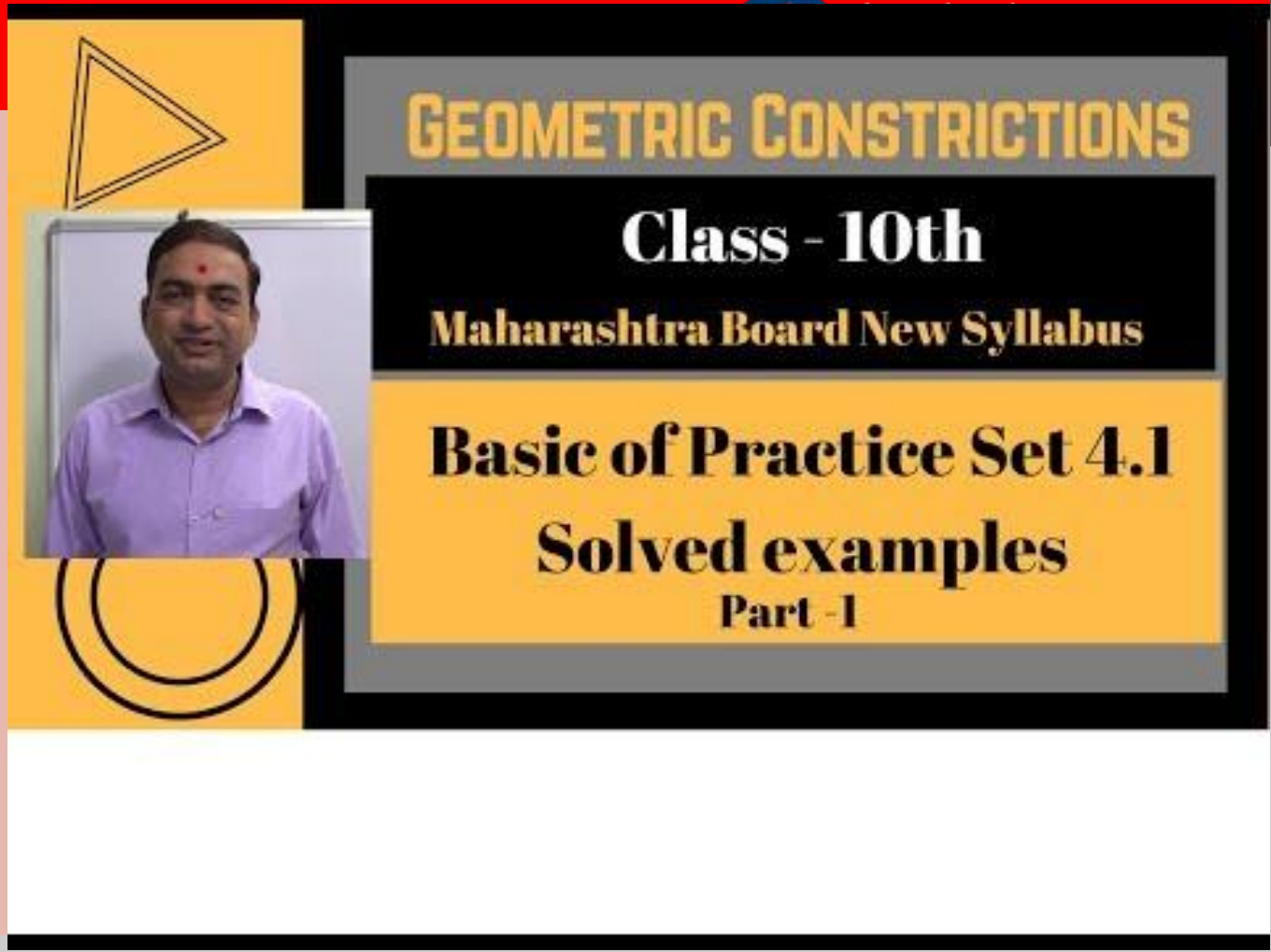
With a common Vertex

Construct any △ ABC.
Construct △ A'BC' such that AB : A'B = 5:3 and

△ ABC ~ △A'BC'

Will there be a common vertex?

Which one will be the common vertex?

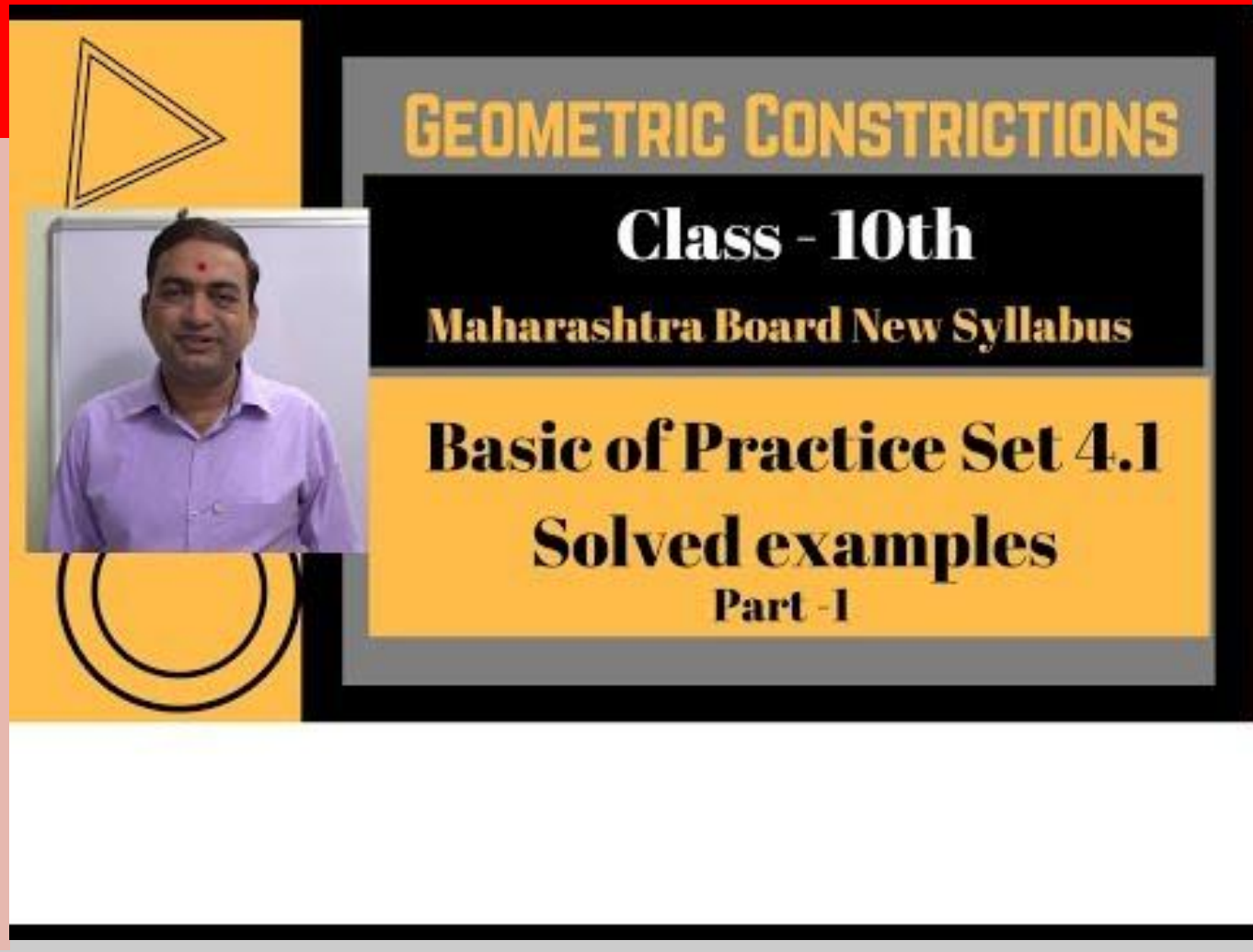


How to construct similar triangles

Construct △A'BC' similar to △ABC such that AB:A'B = 5:7.

Does it have a common vertex?

Before watching the video, try to draw a rough figure.

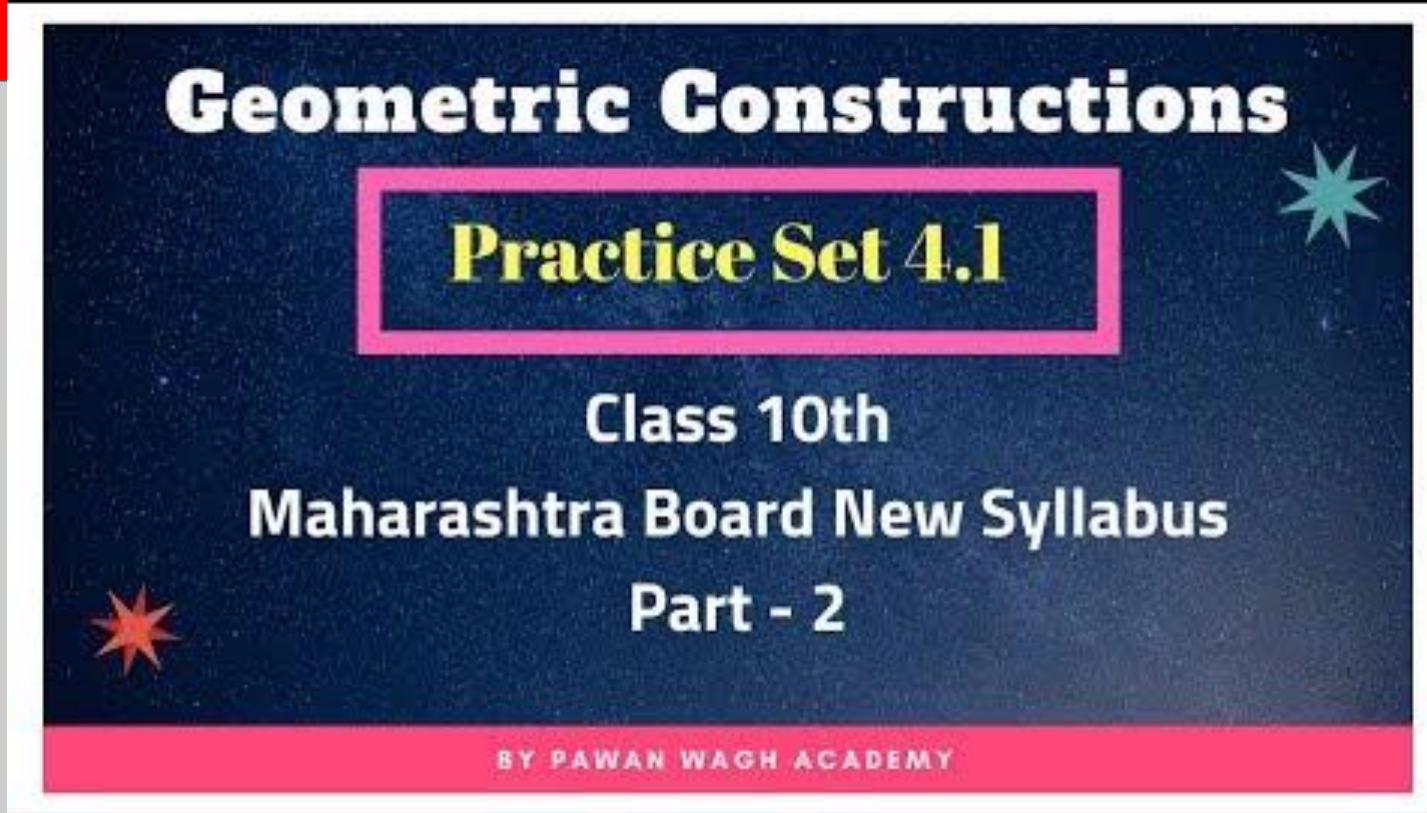


Practice Set 4.1

If you want to watch

The video, please use this link

https://youtu.be/EpXEmlOc7sA



Circles

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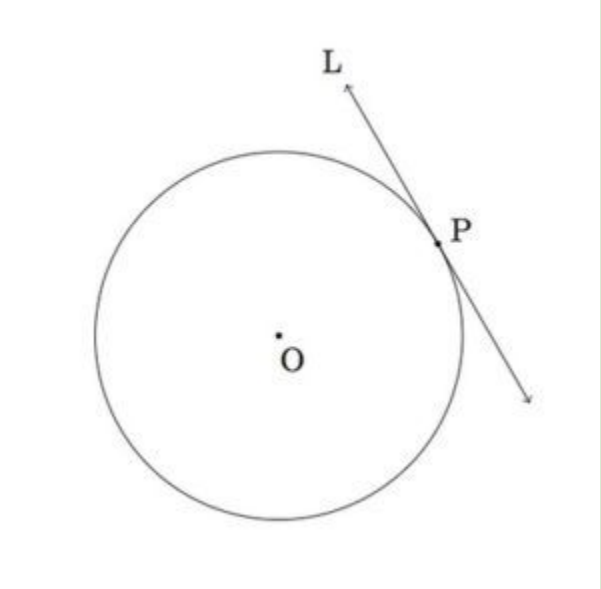
Do you remember

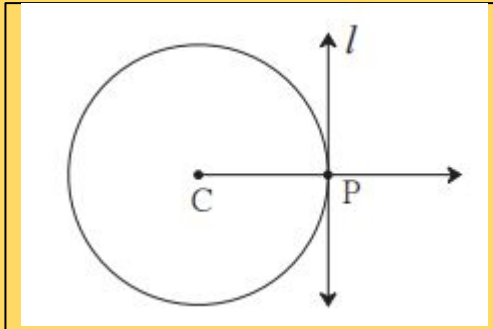
1. What is a diameter, radius, cord of a circle?
2. What is a **tangent**?
3. In the figure given below , what are the following

   letters- O, P, L?



Let us learn to construct a tangent to a circle

Construction of a tangent to a circle at a point on the circle



Centre of the circle - C

P- Point on the circle

CP? Radius?

How will you construct a tangent?

Will it be perpendicular to the radius?

Property :

A line perpendicular to the radius at its outer end is a tangent to the circle.

Construction of a tangent to a circle at a point on the circle- Using the centre of the circle

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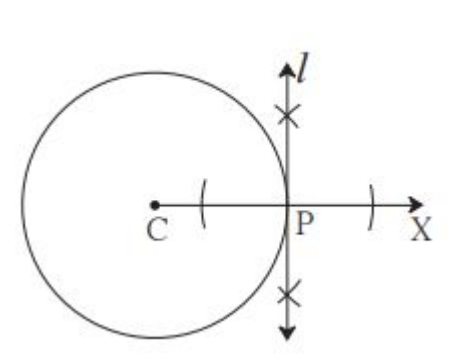
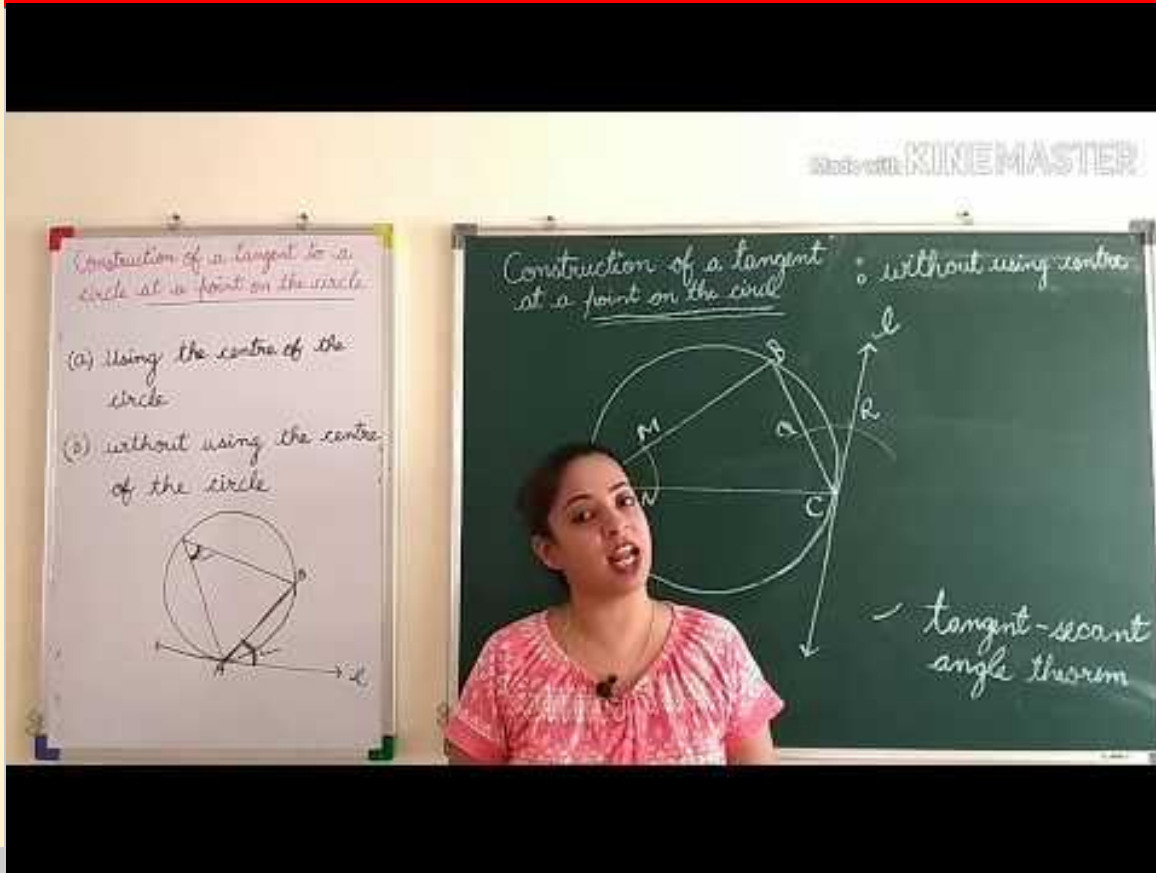
Steps of construction

(1) Draw a circle with centre C. Take any point P on the circle.

(2) Draw ray CP.

(3) Draw line l perpendicular to ray CX through point P. **Line l is the required tangent to the circle at point 'P'.**





Construction of a tangent to a circle at a point on the circle- Without using the centre of the circle

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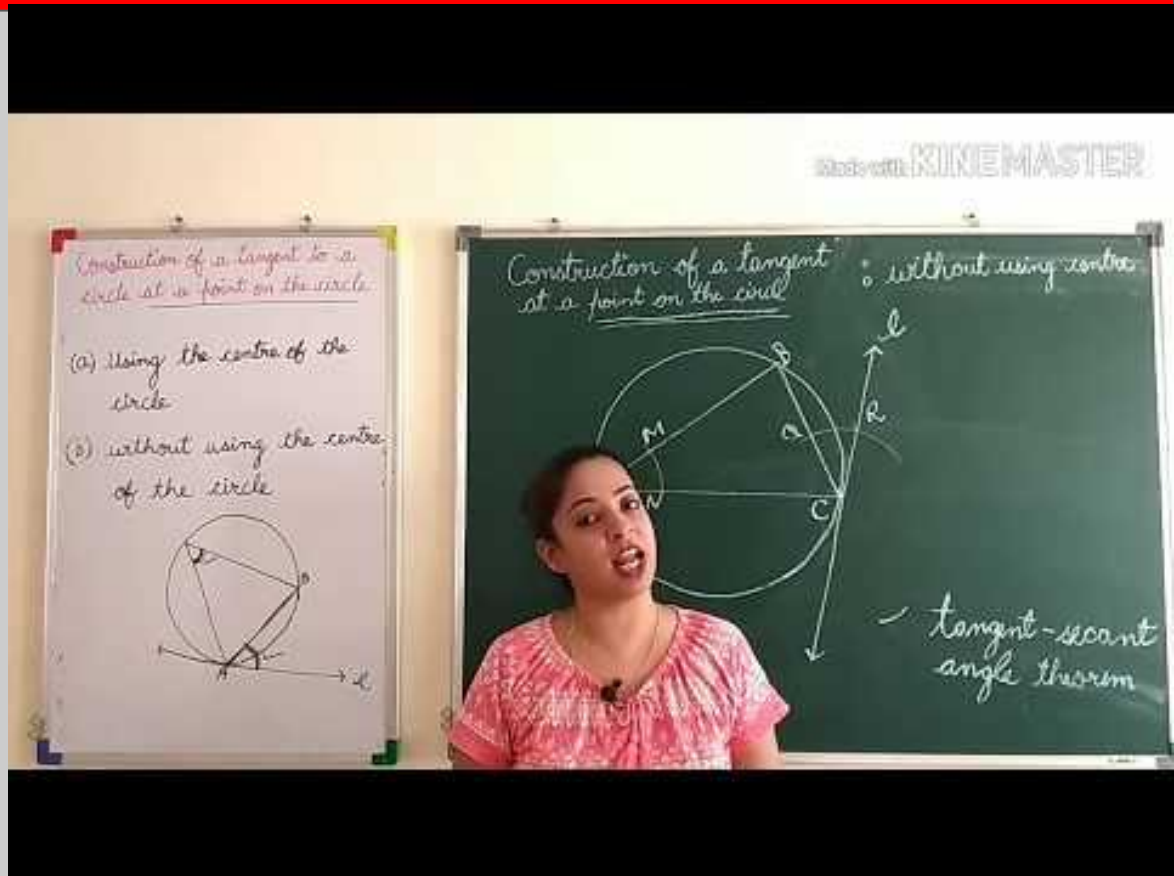
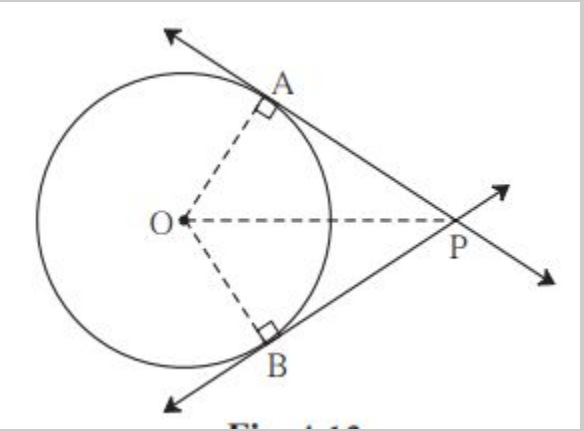
Watch this video twice so that the concept is very clear.

Theorem used here is

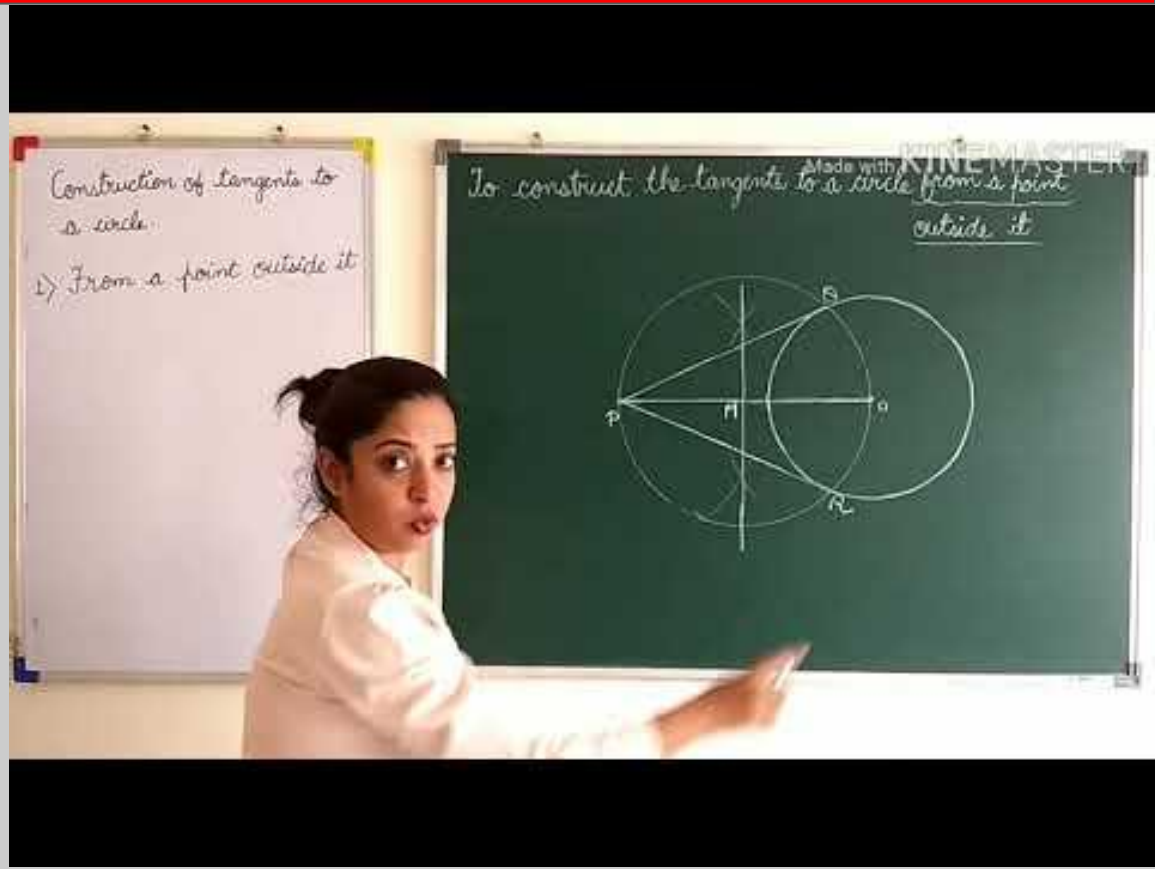
tangent- secant angle theorem



To construct tangents to a circle from a point outside the circle.



P is a point outside the circle.



Practice Set 4.2

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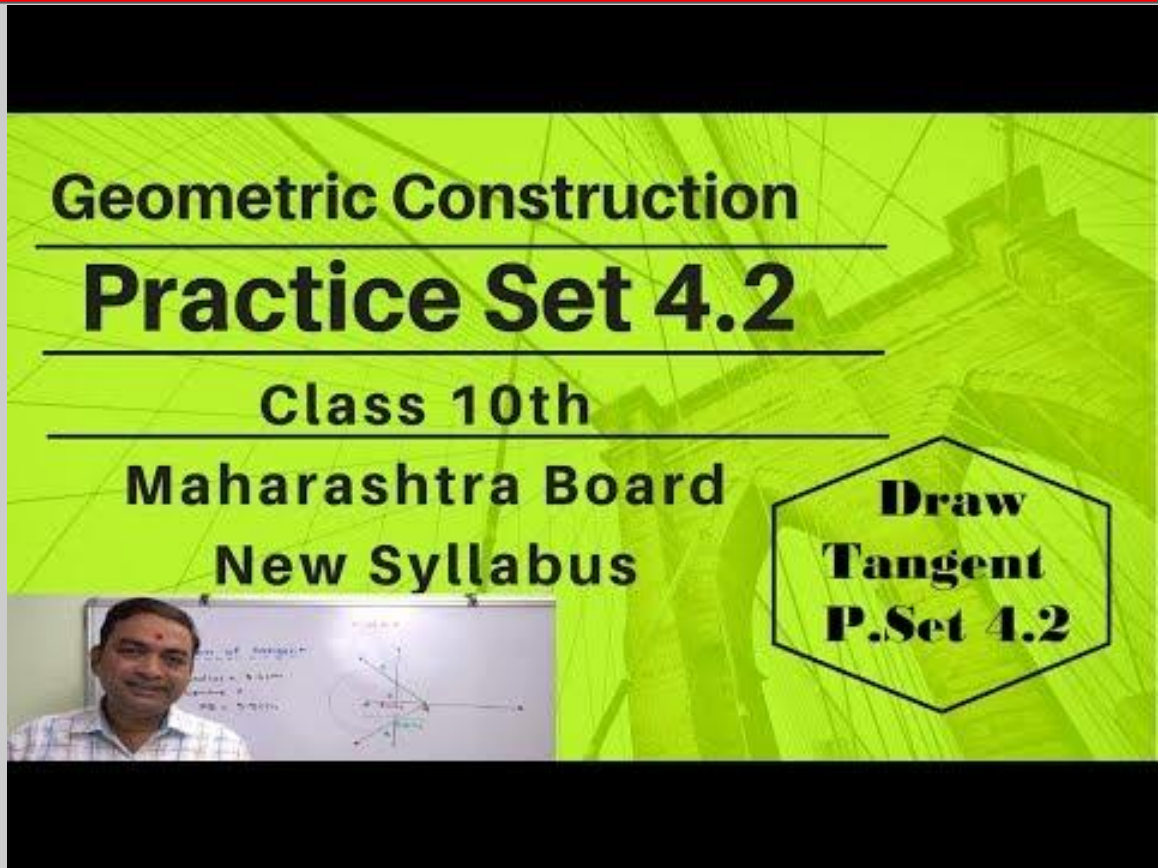
For practice set 4.2 , please share the link

https://www.youtube.com/watch?v=-YiCCqwiRh0

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Thank you