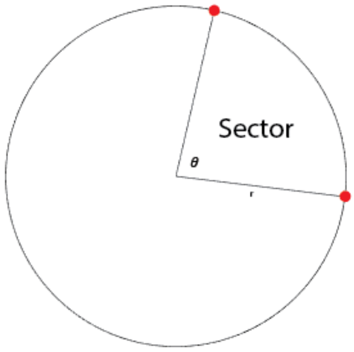
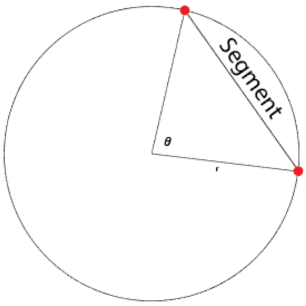
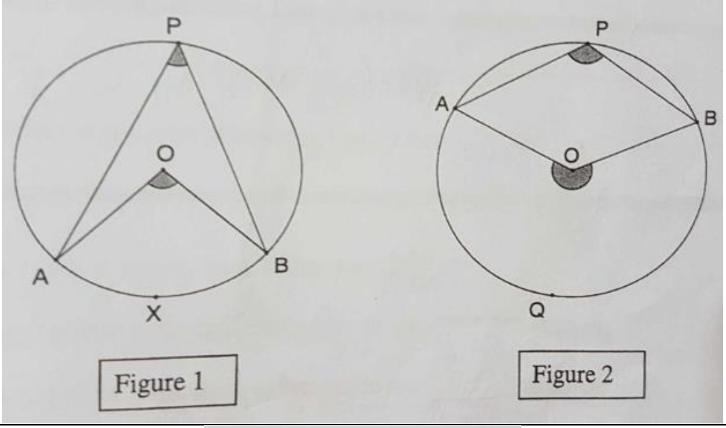
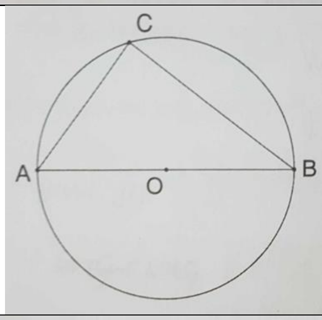
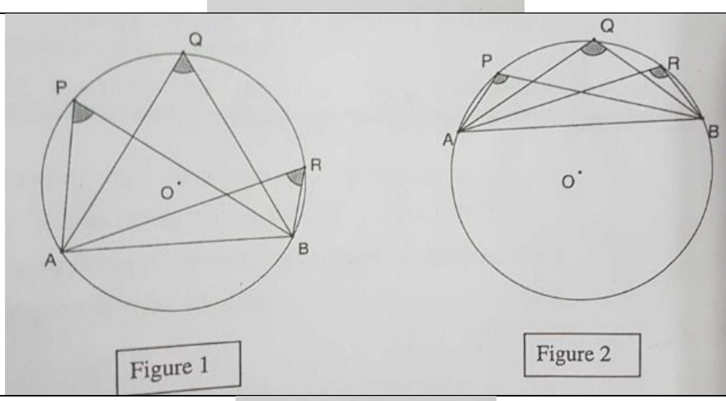
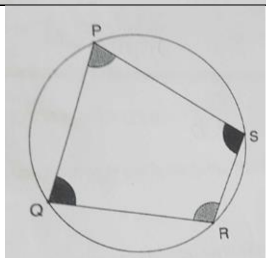
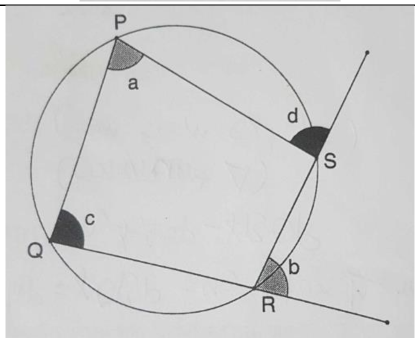
Circle Measure

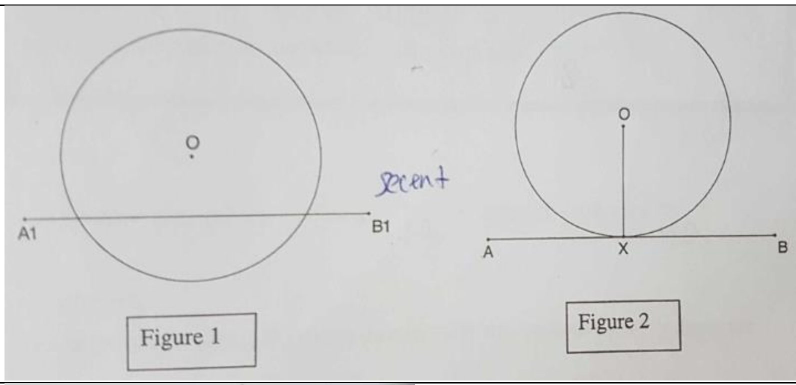
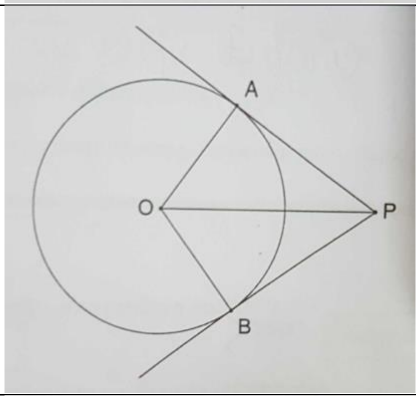
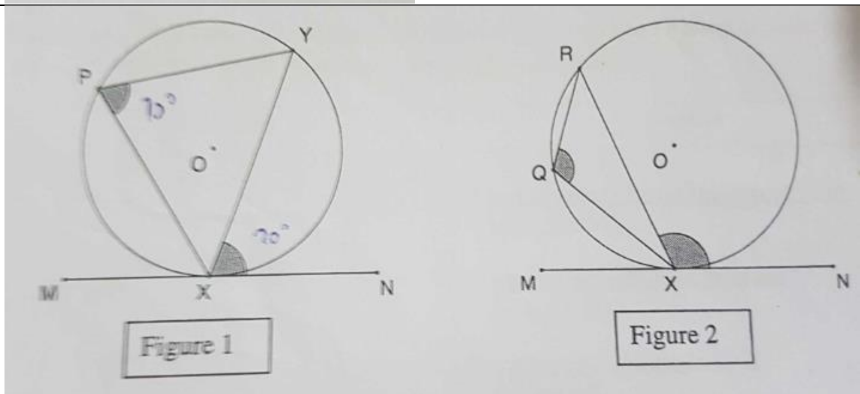
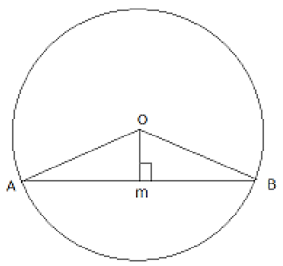
1. Geometrical Properties of Circles

$$\pi \; radians \approx 180°$$
$$2\pi \; radians \approx 360°$$
$$1 \; radian \approx 57.3°$$

1	Degree: $$Arc\ Length = \frac{\theta°}{360°} * 2\pi r$$ $$Area\ of\ Sector = \frac{\theta°}{360°} * \pi r^2$$ Radian: $$Arc\ Length = \theta r$$ $$Area\ of\ Sector = \frac{1}{2}\theta r^2$$	
2	Degree: $$Area\ of\ Segment = \frac{\theta°}{360°} * \pi r^2 - \frac{1}{2}r^2 sin\theta$$ Radiant: $$Area\ of\ Segment = \frac{\theta°}{360°} * \pi r^2 - \frac{1}{2}r^2 sin\theta$$	

2. Geometrical Properties of circles

Angle at the center of the circle is 2x the angle at the circumference subtended by the same arc: **<u>1 Angle at center = 2x angle at segment</u>** $\Delta AOB = 2\,\Delta APB$	
Every angle subtended by the diameter of a semicircle is a 90 degree: **<u>2 Right Angle of Semi-circle</u>** $\Delta ACB = 90°$	
Angle in the same segment of a circle have the same angle: **<u>3 Angle in the same segment</u>** $\Delta APB = \Delta AQB = \Delta ARB$	
In a cyclic quadrilateral, the opposite angle add up to 180 degree: **<u>4 Opposite angle of cycle quad</u>** $\Delta Q + \Delta S = 180°$ $\Delta P + \Delta R = 180°$	
If one side of a cyclic quadrilateral is produced, the exterior angle formed is the same to the interior opposite angle: **<u>5 Ext. angle of cycle quad</u>** $\Delta a = \Delta b$ $\Delta c = \Delta d$	

A tangent to a circle is perpendicular to the radius **<u>6 Tangent perpendicular to radius</u>** $\Delta AXO = \Delta BXO = 90°$	
Tangent from external point **<u>7 Congruent Triangle</u>** $\Delta OAP = \Delta OBP = 90°$ $\Delta APO = \Delta BPO = 30°$ $\Delta AOP = \Delta BOP = 60°$ $\therefore \Delta PAB = Isos.\Delta$	
An angle between a tangent and a chord through the point of contact is the same to the angle in the alternate segment **<u>8 Alternate Segment Theorem</u>** $\Delta YPX = \Delta YXN$ $\Delta RQX = \Delta RXN$	
<u>9 By Simmental Properties</u> Δ $OM \perp AB$ $AM = MB$	
<u>10 Equal chords are equitant from the center</u> $b = d$ $a = c$