Chapter 12  Circle geometry: Tangents

Learning objectives
By the end of this chapter, the students should be able to:
1. Define and apply the properties of a tangent of a circle.
2. Recall, use and apply the following tangent properties to solve circle problems:
   • tangents from an external point are equal
   • the alternate segment theorem
   • angle between tangent and radius = 90°.

Teaching and learning materials
Teacher: Posters, cardboard models, chalkboard instruments (especially a protractor and a compass), computer instructional materials where available.

Glossary of terms
Secant of a circle is a line that intersects the circle in two places or it has two points in common with the circle.
Tangent of a circle is a line that intersects the circle in only one place. We can also say that it has only one point in common with the circle.

Areas of difficulty
• Students tend to forget theorems and deductions made from them.
• Students must always give a reason for each statement that they make which is based on some or other theorem and they either do not give the reason or do not know how.
• To help them you could give them summaries of the theorems and suggestions of the reasons they can give. Below are suggestions:

   Reason: Radius ⊥ tangent

   Reason: Tangents from same point P are =

   Reason: Angle between tangent BD and chord BA = angle on BA

• Students find it difficult to recognise the angle in the alternate or opposite segment which is equal to the angle between the tangent and the chord.
• Teach them that it is always the angle on the chord and the angle that touches the circumference of the circle.
• If they still cannot recognise this, let them put their forefinger and thumb on the chord that shares the point of contact with the tangent and follow the two lines at its ends to the angle on the circumference of the circle.

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