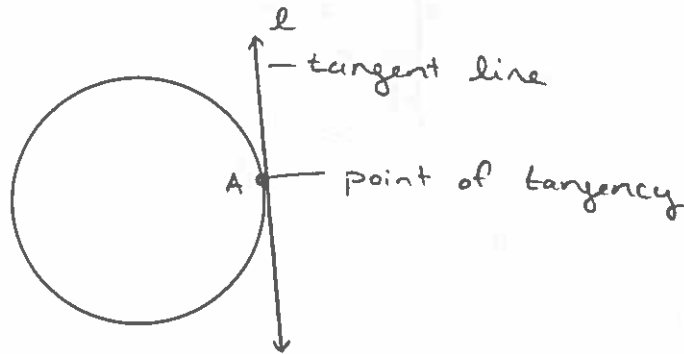


### C: Tangents to a Circle

#### **Tangent to a Circle**

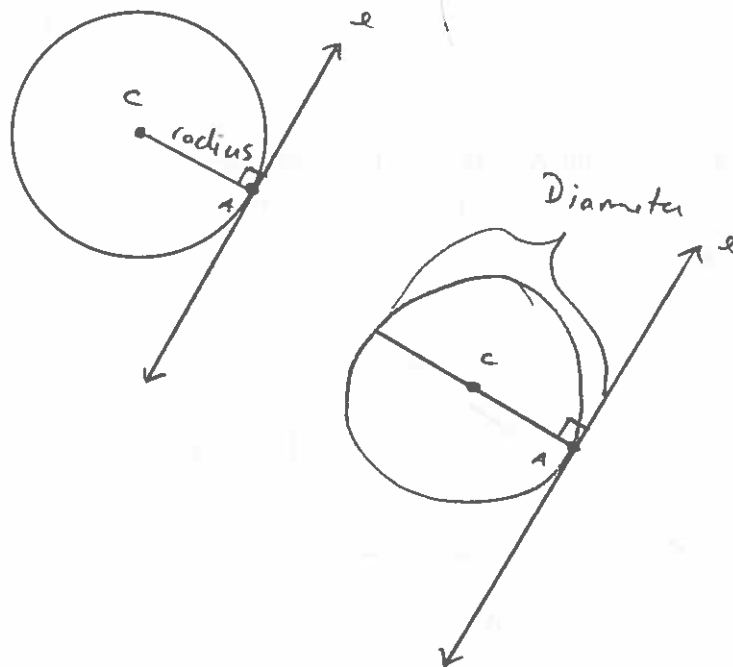
A line that touches a circle at exactly one point is tangent to the circle. The point where it touches is known as the point of tangency.



#### **Tangent Chord Relationship**

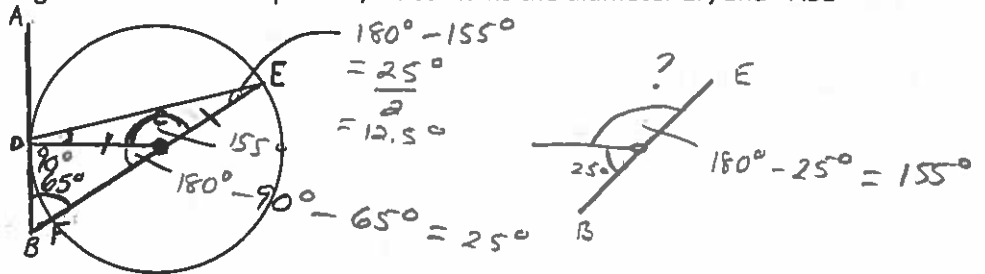
A line that is tangent to a circle at a point is perpendicular to a radius.

A chord drawn perpendicular to a tangent line at the point of tangency contains the centre of the circle and is a diameter.



Examples:

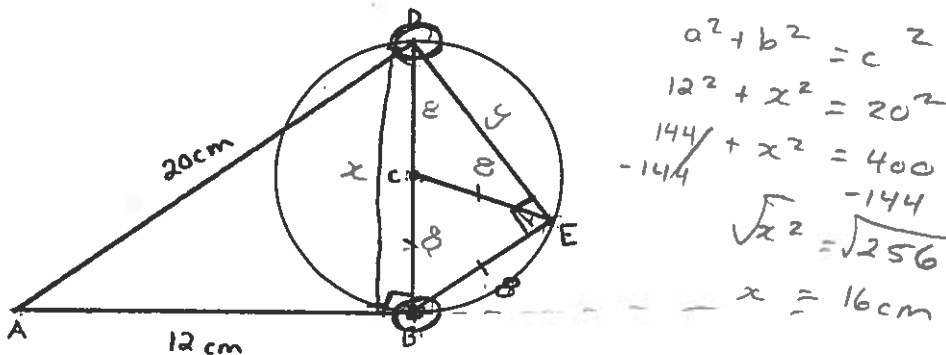
1. In the diagram, AB is tangent to the circle at point D, BE contains the diameter EF, and  $\angle ABE = 65^\circ$ .



Explain your reasoning when answering each of the following questions.

- What is the measure of  $\angle BDC$ ?  
*90° b/c a radius touches a point of tangency.*
- What is the measure of central angle  $\angle DCE$ ?  
*155°*
- What type of triangle is  $\triangle CDE$ ?  
*isosceles*
- What is the measure of  $\angle DEC$ ?  
*12.5°*

2. In the diagram, AB is tangent to the circle at point B. BD is a diameter of the circle, AB = 12 cm, AD = 20 cm, and  $\triangle BCE$  is an equilateral triangle.



- What is the length of diameter BD?  
*16 cm*
- What is the length of chord BE?  
*8 cm*
- What is the measure of inscribed angle  $\angle BED$ ?  
*90°*
- What is the length of chord DE, to the nearest centimeter?

Handwritten calculations for Example 2, part d:

$$a^2 + b^2 = c^2$$

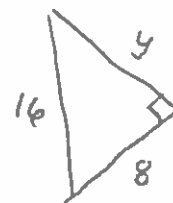
$$8^2 + y^2 = 16^2$$

$$\frac{64}{-64} + y^2 = 256$$

$$\sqrt{y^2} = \sqrt{192}$$

$$y = 13.8$$

$$y = 14 \text{ cm}$$



Pg. 399 #3-9