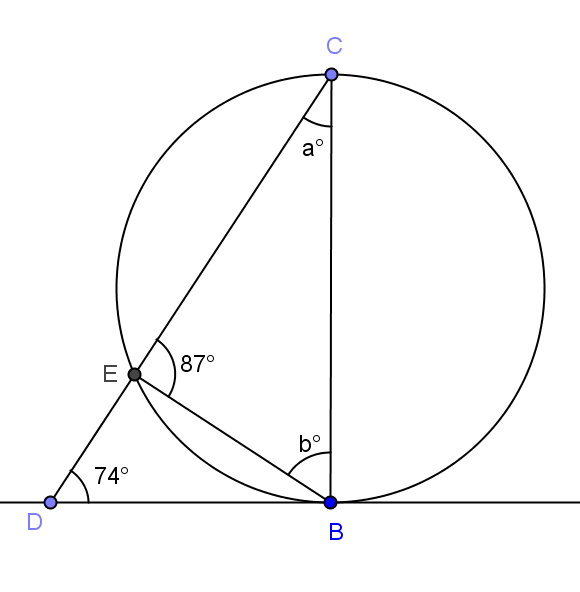
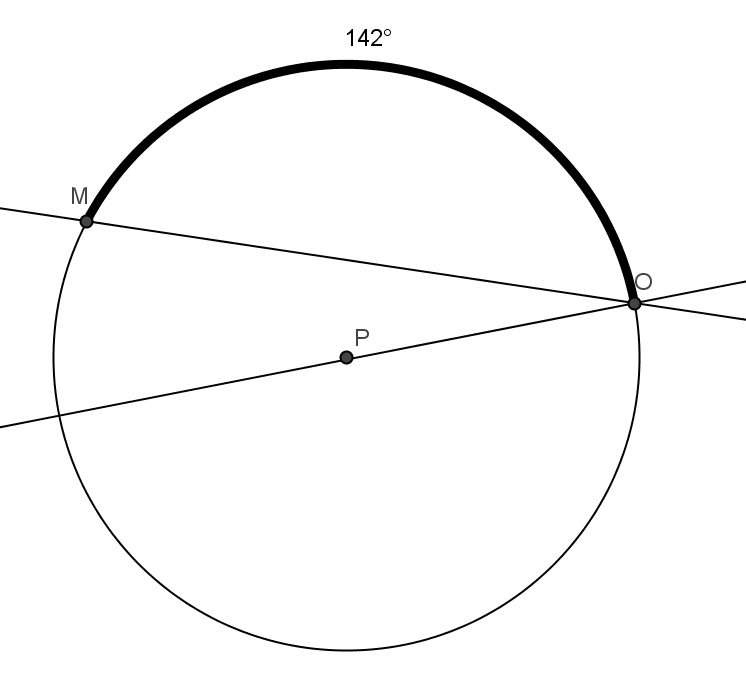
Lesson 14: Secant Lines; Secant Lines That Meet Inside a Circle

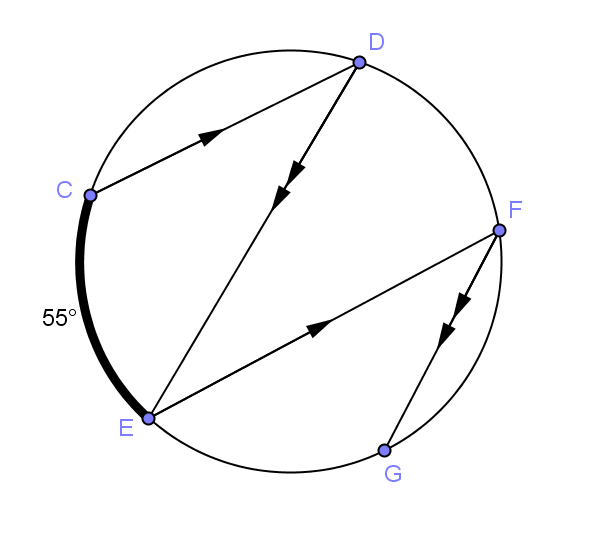
Classwork

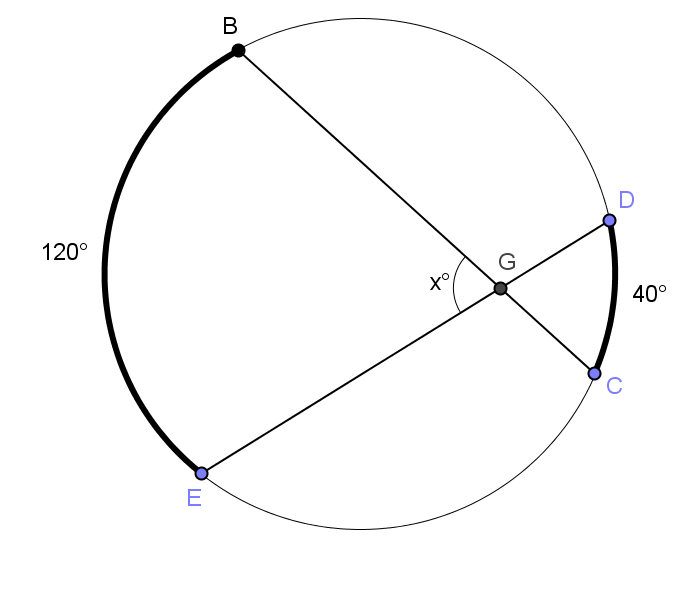
Opening Exercise

 is tangent to the circle as shown.

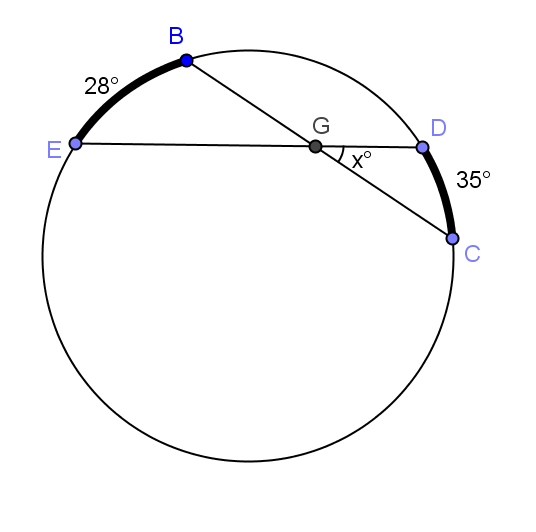
* 1. Find the values of and .
  2. Is a diameter of the circle? Explain.

Exercises 1–2

1. In circle , is a radius, and . Find and explain how you know.
2. In the circle shown, . Find and . Explain your answer.

**Example 1**

* 1. Find . Justify your answer.

****

* 1. Find

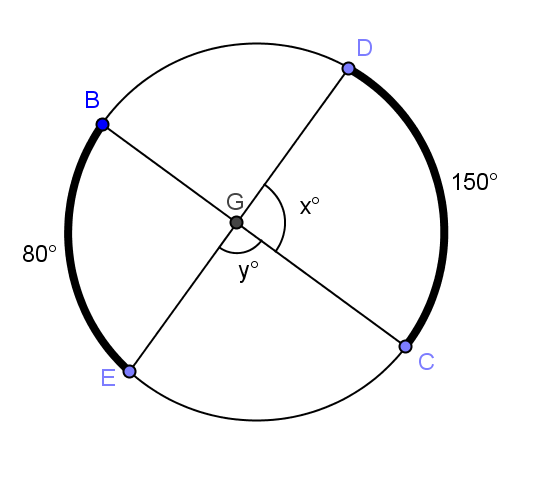
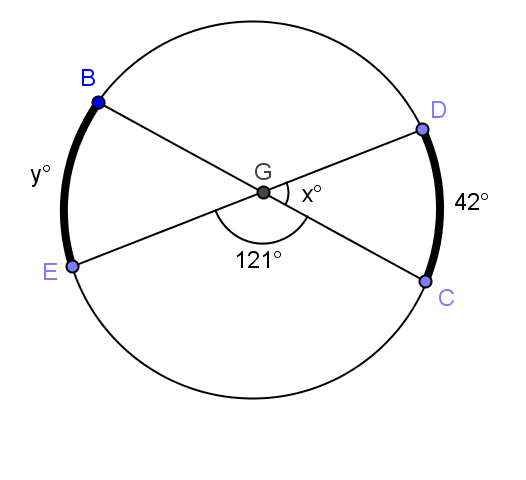
We can state the results of part (b) of this example as the following theorem:

**Secant angle theorem: interior case:** The measure of an angle whose vertex lies in the interior of a circle is equal to half the sum of the angle measures of the arcs intercepted by it and its vertical angle.

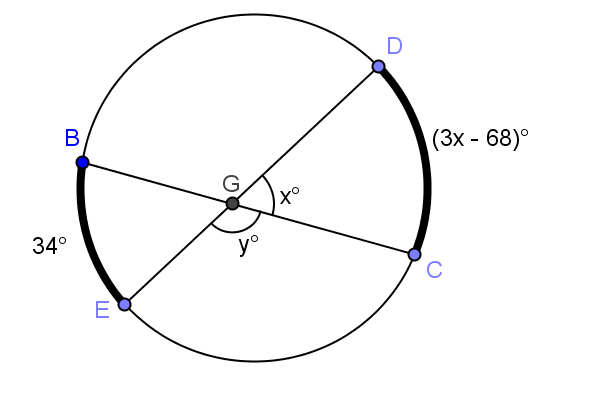
Exercises 3–7

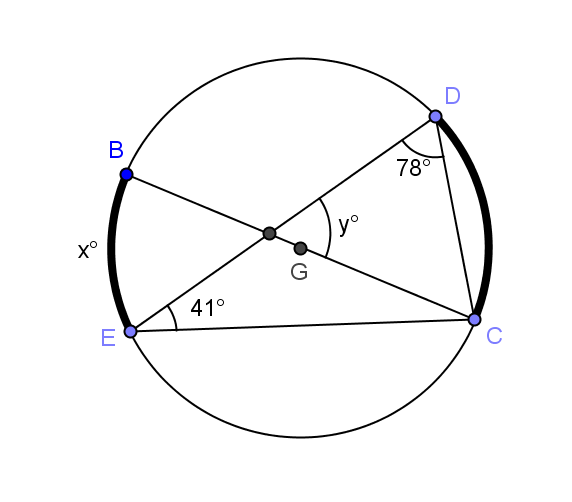
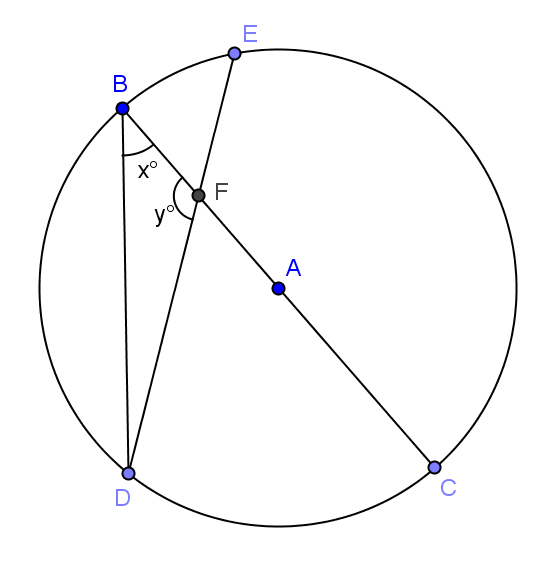
In Exercises 3–5, find and.

3. 4.

**

5.

**

1.  In circle, is a diameter. Find and .
2. In the circle shown, is a diameter. Prove  
    using a two-column proof.

Lesson Summary

Theorems:

* Secant angle theorem: interior case. The measure of an angle whose vertex lies in the interior of a circle is equal to half the sum of the angle measures of the arcs intercepted by it and its vertical angle.

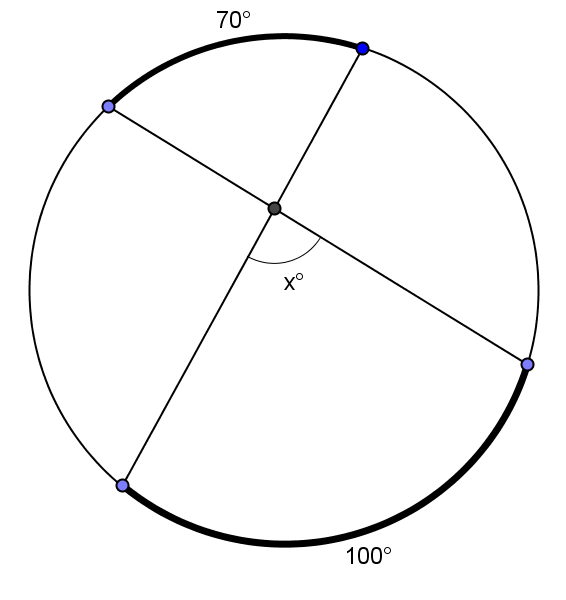
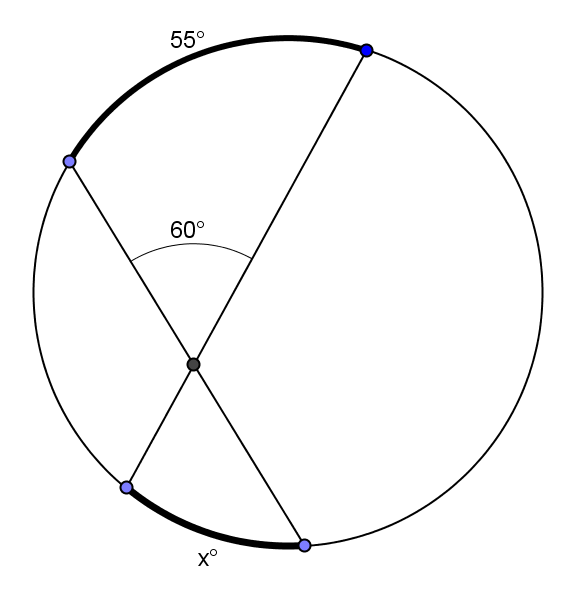
**Relevant Vocabulary**

* **Tangent to a circle:** A *tangent line to a circle* is a line in the same plane that intersects the circle in one and only one point. This point is called the *point of tangency*.
* **Tangent segment/ray**: A segment is a *tangent segment* *to a circle* if the line that contains it is tangent to the circle and one of the end points of the segment is a point of tangency. A ray is called a *tangent ray to a circle* if the line that contains it is tangent to the circle and the vertex of the ray is the point of tangency.
* **Secant to a circle:** A *secant line to a circle* is a line that intersects a circle in exactly two points.

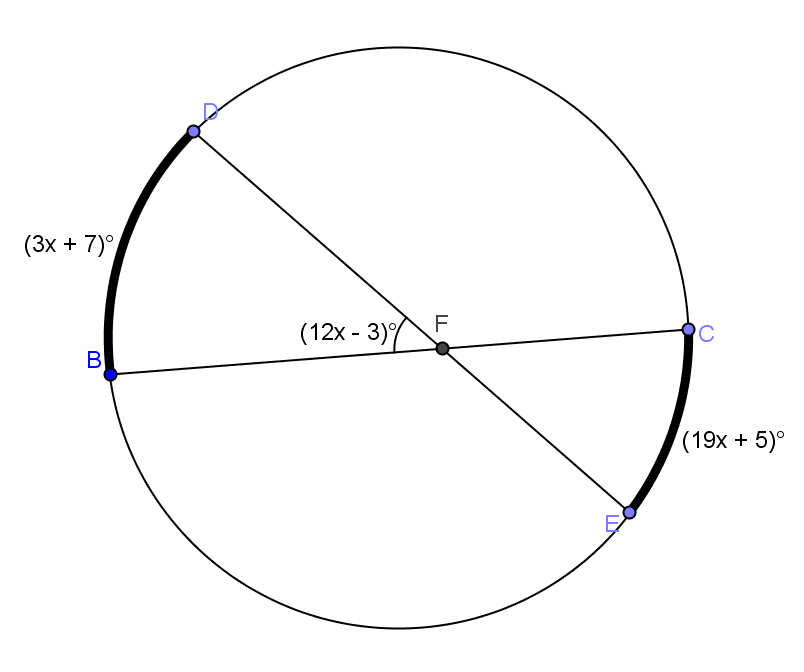
Problem Set

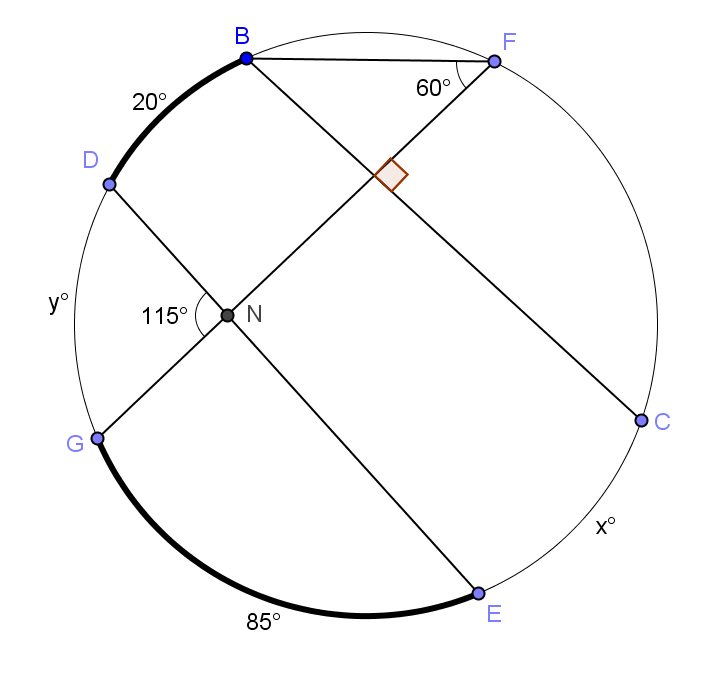
In Problems 1–4, find

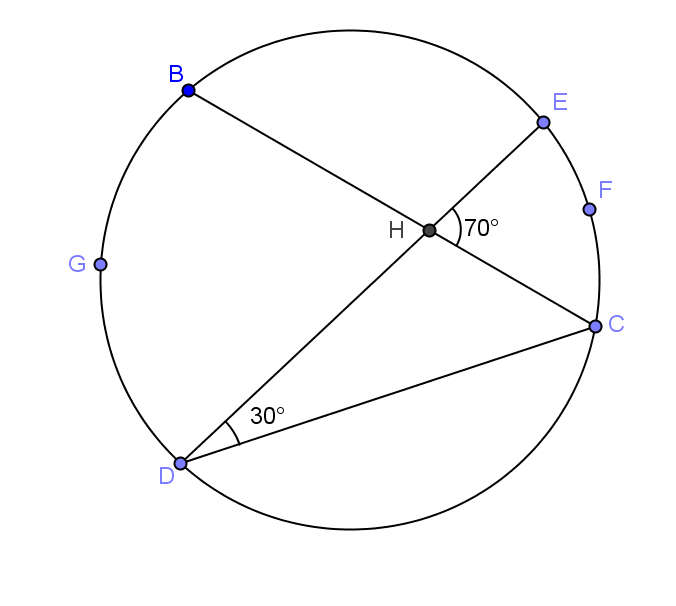
1. 2.

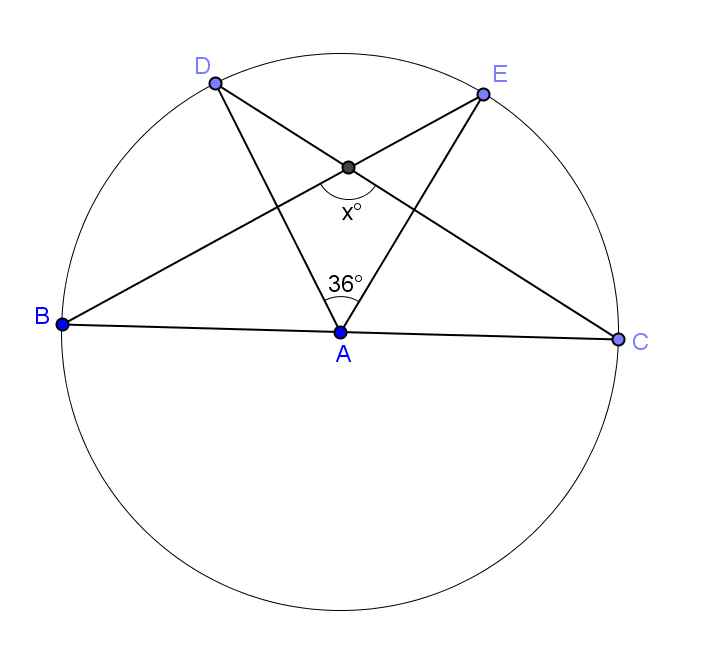
****

3. 4.

****

****5. Find ( and .

6. Find the ratio of .



7. is a diameter of circle . Find

1. Show that the general formula we discovered in Example 1 also works for central angles. (Hint: Extend the radii to form diameters, and use relationships between central angles and arc measure.)

