

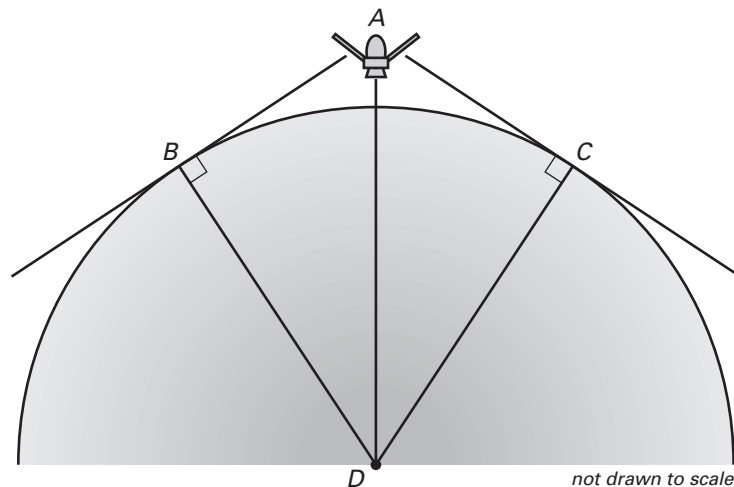
Real-Life Application: When Will I Ever Use This?

For use with pages 595–602

Satellite Transmissions

The field of telecommunications is increasingly relying on satellites. First a tool of the military, they are utilized now by news services, telephone companies, the Internet, and cable and satellite television. Once practically a monopoly by the United States, satellite launches are now done by other countries such as Australia, who compete with NASA for the lucrative business of launching commercial satellites for telecommunication companies.

Satellites have only a limited range because of the curvature of Earth. The transmissions can only reach the points that are tangent to Earth from the satellite. Since it is important to create point to point communications, a network of satellites must be launched to cover a desired area. Some satellites are fixed, or stationary in the sky. These satellites are orbiting Earth at a speed that allows them to hover over the same location. This allows more reliable communication because it is always available to a certain area of coverage. Some orbit at a speed that allows them to travel around the globe and appear at many locations several times a day. These offer more coverage, but are available to locations only for certain parts of the day.



In Exercises 1–5, use the diagram above where the satellite (point A) is stationary.

1. What are the points of tangency from the satellite?
2. Identify the radii.
3. What theorem says that angles ABD and ACD are right angles?
4. Prove triangles ADC and ADB are congruent.
5. What theorem says that \overline{AB} must be congruent to \overline{AC} ?