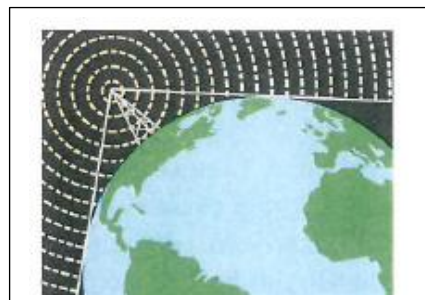# APPLYING THE TANGENT THEOREM

Radio and TV stations broadcast from high towers.

Their signals are picked up by radios and TV's in houses within a certain radius. Because the Earth is spherical, these signals do not get picked up beyond the point of contact of the near horizontal tangent line as illustrated in the sketch.

What is the maximum broadcasting radius from a radio tower 70m tall?
Assume that the circumference of the Earth is 42 650km.
Give your answer to the nearest km.

HELP

Make a drawing and let the distance from Tower (T) to point of contact (A) be d and draw in the

line from (A) to centre of earth (C). Then complete triangle TAC.

What angle is formed between the tangent and the radius?

If it is a right angle, what other theorem can you use in triangle TAC?

Can you find the radius of the earth?

Remember units must be the same.

NEXT

Can you apply your method to various heights of towers or similar situations?

1. A girl sits in a building, 50 m high, and stares at the sea looking for ships. How far can she see? (Assume that the circumference of the Earth is 42 650km. Give your answer to the nearest km).
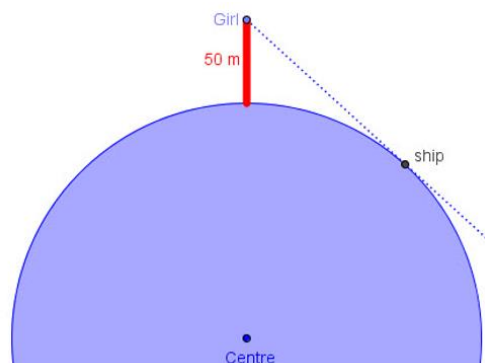
2. You are standing 12 meters from a cylindrical storage tank. The distance from you to the point of tangency on the tank is 35 m.

    What is the radius of the tank?