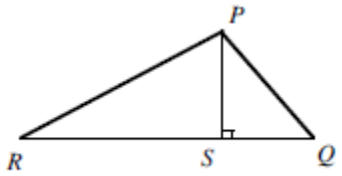
Lesson 3.5: Solving Problems Involving 2 or More Triangles

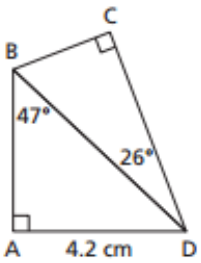
Specific Outcome: 4.3 – Solve right triangles, with or without technology. 4.4 – Solve a problem that involves one or more right triangles by applying the primary tri ratios or the Pythagorean theorem.

We can use trigonometry to solve problems that can be modelled using right triangles. When more than one right triangle is involved, we have to decide which triangle to start with.

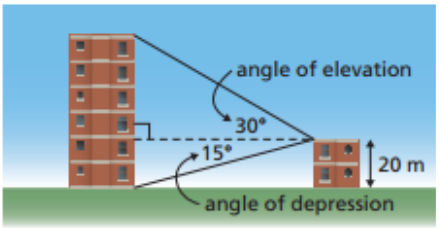
In the diagram QS = 32 mm, ∠ PQS = 50°, and ∠ RPS = 61°. Use this information to determine the length of QR to the nearest mm.



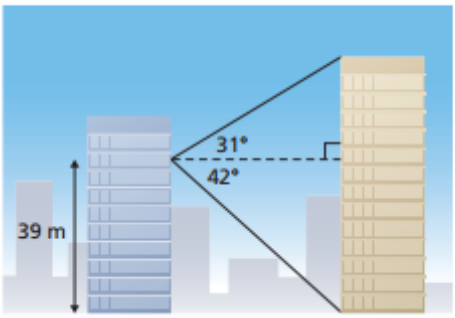
Practice 1. Calculate the length of CD to the nearest tenth of a centimetre.



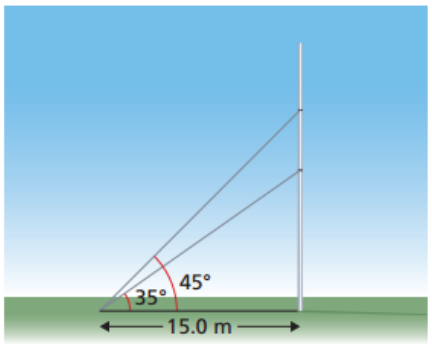
2. From the top of a 20-m high building, a surveyor measured the angle of elevation of the top of another building and the **angle of depression** of the base of that building. The surveyor sketched this plan of her measurements. Determine the height of the taller building to the nearest tenth of a metre.



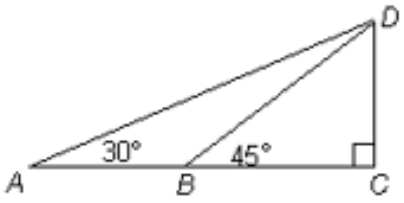
3. A surveyor stands at a window on the 9th floor of an office tower. He uses a clinometer to measure the angles of elevation and depression of the top and the base of a taller building. The surveyor sketches this plan of his measurements. Determine the height of the taller building to the nearest tenth of a metre.



4. A student wanted to know the distance between two particular carvings on a spirit pole. She measured the angle of elevation of each carving 15.0 m from the base of the pole. The student drew the sketch below. What is the distance between the carvings to the nearest tenth of a metre?



5. A person observes that from point A the angle of elevation to the top of a cliff (D) is 30°. Another person at point B notes that the angle of elevation to the top of the cliff is 45°. If the height of the cliff is 80.0 m, find the distance between points A and B, to the nearest tenth.



HOMEWORK: P. 118 – #3-5(ac), 13, booklet