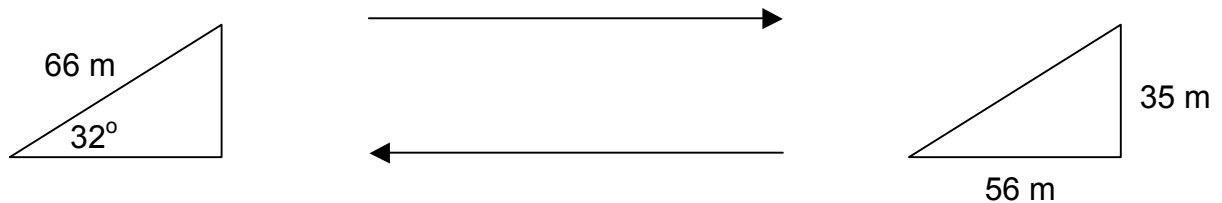


Applications of Right Angle Triangles – Day 1

One of the main applications of right angle trigonometry is converting between the different ways that a length can be measured when it is two-dimensional:

(if we know the length and the angle then we can calculate the perpendicular lengths)



(we can calculate the length and the angle if we know the perpendicular lengths)

Example – A hiker looks directly east, then turns 55° towards the north, and follows a straight trail for 7 km. Determine how far east the hiker travelled, and how far north the hiker travelled.

Example – A hiker walked 5 km west in the morning and 9 km north in the afternoon. Draw a diagram to represent this scenario then calculate the length and angle that represent the shortest distance between the start to end points.

Example – A guy wire will be anchored to the ground at a location that is 4.6 m away from the base of a radio communication tower. It will be attached to the tower at a point that is 12 m above the ground. Determine the necessary length of the wire and its angle of elevation.

Example – The towrope pulling a parasailor is 68 m long. A boat crew member estimates that the angle between the towrope and the water is about 35° . Find the height of the parasailor above the water.

Example – A snowboarder leaves a jump with a speed of 52 km/h at an angle of 48° above horizontal. Determine the horizontal speed of the snowboarder and the vertical speed of the snowboarder leaving the jump.

Homework – Please solve the following problems and answer questions # 15, 19 and 24 on page 374 and question #7 on page 381.

1. One of the guy wires that is attached to a radio communication tower will be anchored 3.5 m to the west of the tower and will connect to the tower 9 m above the ground. A second wire will be 14 m long and it will make an angle of 55° with the ground where it is anchored to the east of the tower.
 - a) determine the length of the first wire and the angle it makes with the ground
 - b) determine how far the second wire is anchored from the base of the tower, and how high above the ground it is connected to the tower

2. Determine the horizontal speed and vertical speed of a snowboarder who leaves a jump at an angle of 38° above horizontal at a speed of 61 km/h