Math 1316: 2-15 Worksheet

February 15, 2022

For these problems: First, draw a picture which illustrates the set up, identifying the known angles and side lengths of the triangle(s) involved. Then, use this picture to calculate the desired distance.

1. You stand on the edge of the roof of a building which is 413 feet away from a clocktower. Looking up, the top of the clocktower is at an angle $8°$ above you, and the bottom of the clocktower is at an angle $4°$ below you. Calculate the height of the clocktower.

2. You are part of a construction team building a funicular[1] to transport people from the bottom of a hill to the top. You need to determine how long a cable is needed, for which you need to know the distance from the base to the top of the hill. You measure that hill is at a slope of $48°$. At a distance of 120 meters from the base of the hill you measure that the top of the hill is at an angle of of $24°$ above the ground. Calculate the length from the base to the top of the hill.

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[1]A cable railway on a track up a slope, using two carriages to counterbalance each other.