

Day 5: Complex Trig Problems

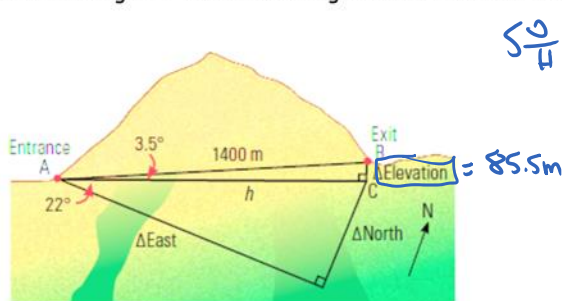
Tuesday, November 26, 2013 12:21 PM

AW Math 11

Day 5: Breaking Shapes into Recognizable Right Triangles class notes

Example 1:

A tunnel through a hill has an angle of elevation of 3.5° , and a direction of 22° north of east. The length of the tunnel along its floor is 1400 m. Examine the diagram below.

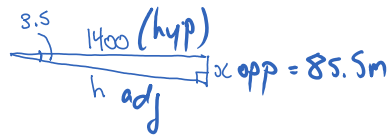


$$\frac{SO}{H} \quad \frac{CA}{H} \quad \frac{TO}{A}$$

a) What is the difference in elevation between the entrance and the exit of the tunnel?

$$\frac{\sin 3.5^\circ}{1} = \frac{x}{1400}$$

$$x = 85.5 \text{ m}$$



b) How far north of the entrance is the tunnel exit? How far east is the exit?

Find "h" first

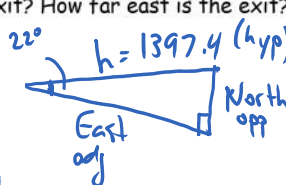
$$c^2 - b^2 = a^2$$

$$1400^2 - 85.5^2 = h^2$$

$$1952689.75 = h^2$$

$$h = 1397.4$$

$$\frac{SO}{H} \quad \frac{CA}{H} \quad \frac{TO}{A}$$



$$1. \frac{\sin 22^\circ}{1} = \frac{N}{1397.4}$$

$$N = 523.48 \text{ m}$$

$$2. \frac{\cos 22^\circ}{1} = \frac{E}{1397.4}$$

$$E = 1295.6 \text{ m}$$

Assignment # 1-3a

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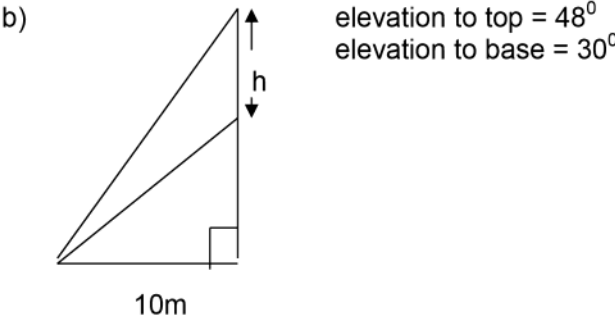
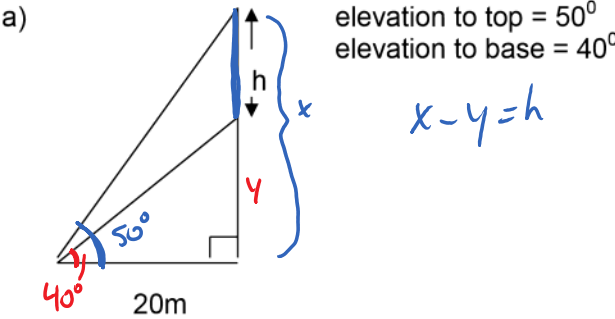
h

Example 2:

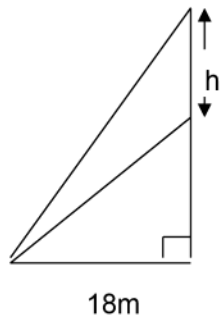
Bethany is standing on the edge of a building. She can see that the angle of elevation to the top of the next building is 46° and the angle of depression to the bottom of the building is 62° . If the building is 30 m away, how tall is it?

Day 5: Breaking Shapes into Recognizable Portions assignment

1. Find the height of the antenna in the following questions.



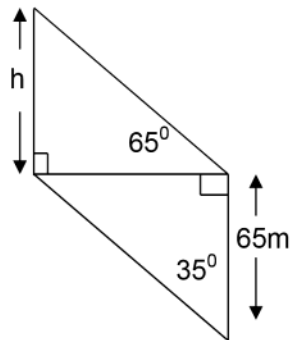
c)



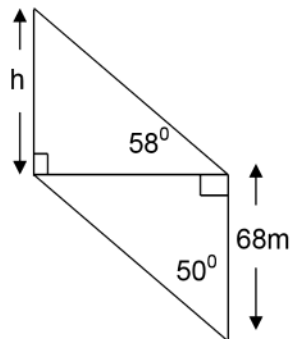
elevation to top = 45°
elevation to base = 30°

2. Find the height of the cliff in the following questions.

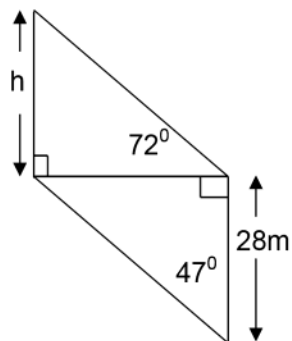
a)



b)

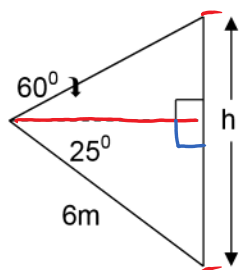


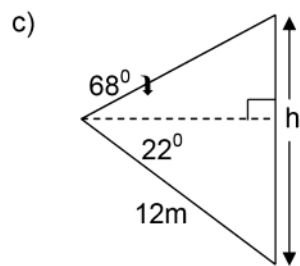
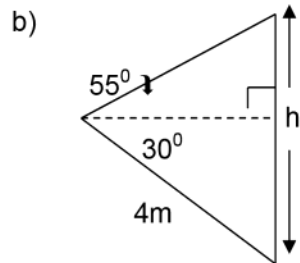
c)



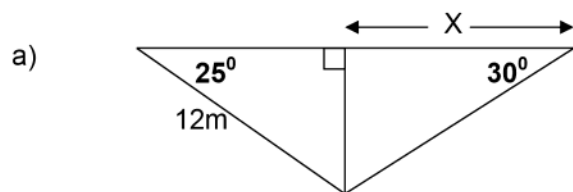
3. Find the height of the tree in the following diagrams. *2 BUILD EX.*

a)

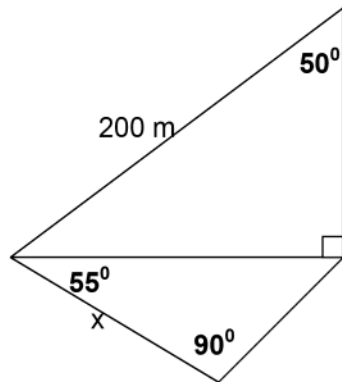




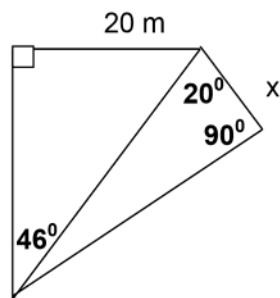
4. Find the value of x in the following diagrams



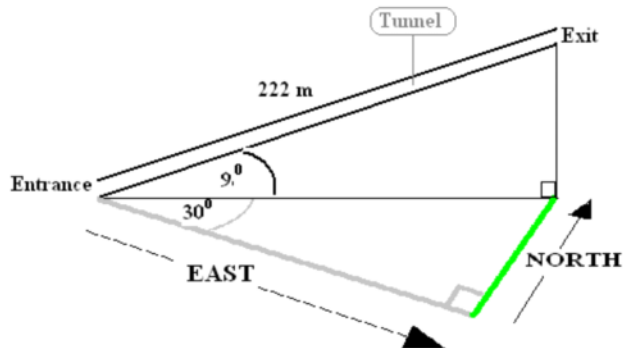
b)



c)



5. A tunnel through a hill has an angle of elevation of 9° , and a direction of 30° north of east. The length of the tunnel along its floor is 222 m. Study the diagram below.



- a) What is the difference in elevation between the entrance and the exit of the tunnel?
- b) How far north of the entrance is the tunnel exit? How far east is the exit?