

Sections 6.1 & 6.2 Word Problems

What I will give you:

Area of triangle:

$$\text{Area} = \frac{1}{2}bc\sin A$$

and

Heron's formula for the area of a triangle:

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{where } s = \frac{a+b+c}{2}$$

What you need to memorize:

Law of Sines – used with AAS, ASA, and SSA:

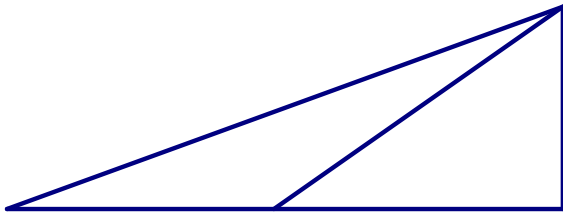
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

and

Law of Cosines – used with SAS & SSS

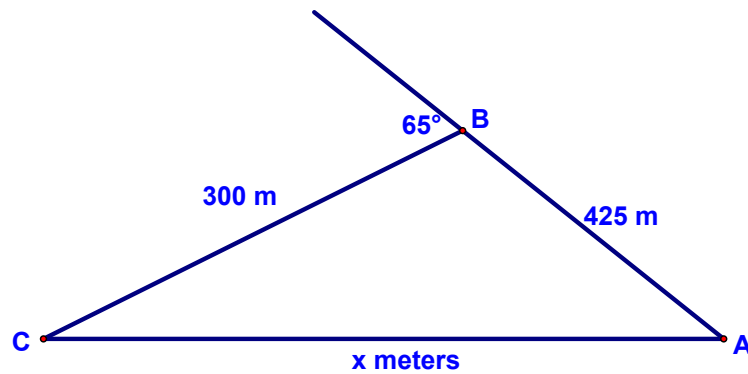
$$c^2 = a^2 + b^2 - 2ab\cos C$$

1. From a certain distance, the angle of elevation to the top of a building is 20° . At a point 40 meters closer to the building, the angle of elevation is 35° . Approximate the height of the building to three decimals.



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2. To approximate the length of a marsh, a surveyor walks 425 meters from point A to point B. Then the surveyor turns 65° and walks 300 meters to point C. Approximate the length AC of the marsh:



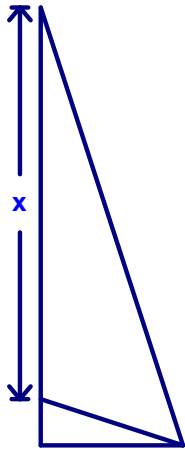
3. A ski jump that is 17 feet long rises at an angle of 10.4° from the horizontal. New regulations indicate that the jump is too dangerous, so the angle is lessened to 7.5° and the ramp is lengthened.

How much longer is the new ramp?

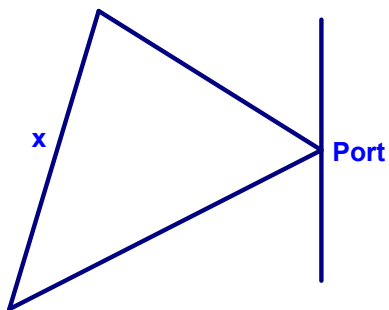


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4. Charlotte is flying a kite such that the kite is up a hill from where she is standing. The angle of elevation of the kite is 72° and the length of the string is 68 ft. If the slope of the hill is 18° , find the height of the kite (x) relative to the ground on the hill.



5. Two ships leave port at 9am. One ship travels at a bearing of $N 58^\circ W$ at 10 knots and the other travels at a bearing of $S 63^\circ W$ at 16 knots. How far apart are the ships at 11am?



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6. From a certain distance, the angle of elevation to the top of a building is 17° . At a point 50 meters closer to the building, the angle of elevation is 31° . Approximate the height of the building using the law of sine (rather than just right triangle trig).