

Geometry Review

Pythagorean Theorem and Trig Ratios 2

- 1) The beautiful young princess of Polygonia is very upset. Her father, the king, has chosen a husband for her but she is in love with someone else. In order to ensure that the princess will not escape and elope with her prince charming, the king has locked her in the tower until the marriage ceremony.

The princess could escape through the window, but it is 50 feet above the ground. An alligator-infested moat, which is 10 feet wide, surrounds the tower. Naturally her prince charming is planning to rescue her. He wants to use an arrow to shoot a rope up to her window. She can slide down the rope to the other side of the moat. He has tried to rescue the princess every night but each time his rope has been too short. Assuming they need an extra 1.5 feet at each end to tie off the rope, determine the minimum length of rope needed to rescue the princess.

- 2) Railroad designers are always looking for ways to improve the safety and comfort of train travel. Suppose technology made it possible to make and transport straight rails one mile long. If one winter two pairs of these rails were installed along a two mile portion of track in the desert, then each rail would expand approximately one foot in length in the summer heat.

Suppose that instead of buckling, these rails keep their (straight) shape. In this case, the ends where they meet could jut upward to form a triangle. How high above the ground would the ends of the rails be?

- 3) A child's shoe box measures 4" by 6" by 3". What is the longest pencil you could fit into this box? An empty box may help you visualize the various ways you could fit the pencil in the box. If possible, draw a diagram to show the pencil's position. Show your work.

Given the right triangle below, and the measures of the sides and angles as defined, find the measures of all other sides and angles.

4. $A = 39^\circ 12'$, $b = 2.1$

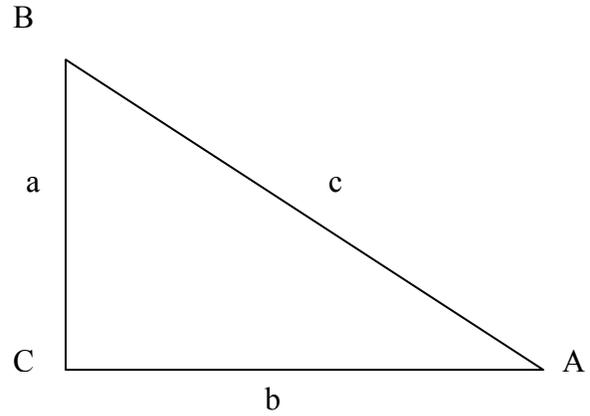
5. $a = 9$, $B = 49^\circ$

6. $B = 64^\circ$, $b = 19.2$

8. $A = 16^\circ$, $c = 14$

10. $c = 21.3$, $A = 26^\circ 20'$

12. $A = 55^\circ 55'$, $c = 16$



7. $B = 56^\circ 48'$, $c = 63.1$

9. $a = 0.4$, $c = 0.5$

11. $a = 2$, $b = 7$

13. $a = \sqrt{15}$, $B = 18^\circ$