

Unit 8: Extended Trigonometry [55 total pts]

I. Solve for the missing value. Round lengths to nearest tenths and angles to nearest whole degree. [30 pts]

**Answers having no supporting arithmetic work will not be scored.**

- Make sure to check for the ambiguous case when applicable.
- If there are two triangles, state both values.
- If there is no triangle, state "No Solution".

1.  $\angle A = 40^\circ, \angle B = 20^\circ, a = 2, b =$  \_\_\_\_\_      2.  $a = 6, b = 5, c = 8, \angle A =$  \_\_\_\_\_

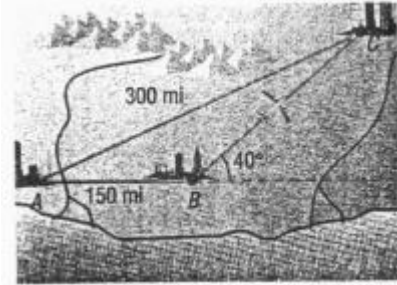
3.  $b = 3, c = 11, \angle A = 32^\circ, \angle C =$  \_\_\_\_\_      4.  $b = 2, c = 3, \angle B = 40^\circ, \angle C =$  \_\_\_\_\_

5.  $a = 4, b = 1, \angle C = 40^\circ, c =$  \_\_\_\_\_

- II. Solve each application problem. Set up the equation you use to solve each problem. *Round lengths to nearest tenths and angles to nearest whole degree.* Include units with your answer. [25 pts]

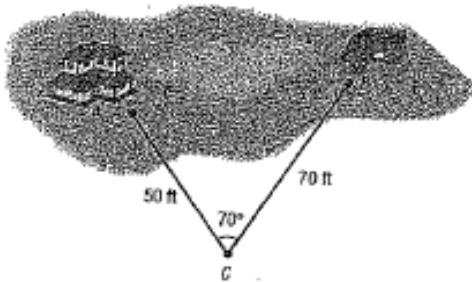
**Answers having no supporting arithmetic work will not be scored.**

6. An airplane flies from city A to city B, a distance of 150 miles. Then the plane turns through an angle of  $40^\circ$  and heads toward city C. If the distance between cities A and C is 300 miles, how far is it from city B to city C?



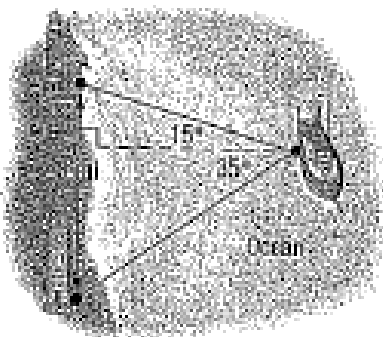

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7. Two houses are located on opposite sides of a lake. A surveyor measures  $\angle ACB$ , which is found to be  $70^\circ$ . He then walks off the distance to each house, 50 feet and 70 feet respectively. How far apart are the houses?



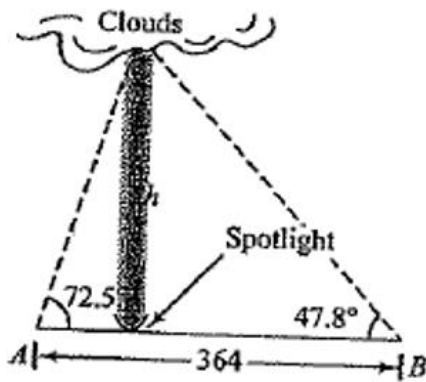

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8. Alexander is sailing in his new boat and is lost at sea. He recognizes two lighthouses that he knows are 3 miles apart. He determines the angles formed between the two lighthouses and the line of sight from the ship directly to the shore are  $15^\circ$  and  $35^\circ$ . How far is the ship from the northern light house?



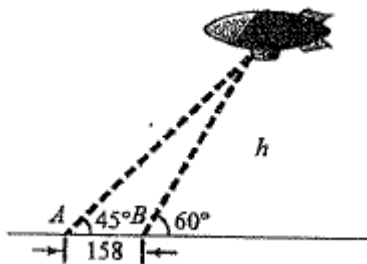

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9. To measure the height of clouds, a spotlight is aimed vertically. Two observers at points A and B, 364 feet apart and in line with the spotlight, measure angles  $\alpha = 72.5^\circ$  and  $\beta = 47.8^\circ$ . how far from the ground is the bottom of the cloud level?




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10. In order to find the height of the Metlife blimp, observers at A and B, 158 yards apart, measure the following angles,  $\alpha = 45^\circ$  and  $\beta = 60^\circ$ . How high (vertically) is the blimp from the ground?




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