Honors Pre-Calculus

Law of Sines/Cosines, Right Triangles, and Area Review

Solve each triangle. Round your answers to the nearest tenth.

1) \[ \triangle ABC \]
   - \( a = 6 \text{ km} \)
   - \( b = 9 \text{ km} \)
   - \( c = 13 \text{ km} \)

2) \[ \triangle ABC \]
   - \( a = 10 \text{ km} \)
   - \( b = 11 \text{ km} \)
   - \( \angle C = 108^\circ \)

3) \[ \triangle ABC \]
   - \( \angle A = 52^\circ \)
   - \( a = 32 \text{ m} \)
   - \( \angle C = 17^\circ \)

4) \[ \triangle PHK \]
   - \( \angle P = 34^\circ \)
   - \( \angle K = 109^\circ \)
   - \( h = 13 \text{ m} \)

Solve each right triangle. Round answers to the nearest tenth.

5) \[ \triangle ABC \]
   - \( \angle C = 41^\circ \)
   - \( a = 8 \text{ m} \)

6) \[ \triangle ABC \]
   - \( \angle C = 23^\circ \)
   - \( b = 5 \text{ m} \)
   - \( a = 2.3 \text{ m} \)
Solve each triangle. Round your answers to the nearest tenth.

7) In \( \triangle CAB \), \( m \angle C = 39^\circ \), \( m \angle B = 14^\circ \), \( a = 33 \) 
8) In \( \triangle FDE \), \( m \angle F = 43^\circ \), \( e = 28 \), \( f = 23 \)

9) In \( \triangle EFD \), \( m \angle E = 130^\circ \), \( d = 31 \), \( e = 31 \)

Find the area of each triangle to the nearest tenth.

10)

\[ \text{Area} = \frac{1}{2} \times 12 \times 11 \times \sin \angle Y \]

11)

\[ \text{Area} = \frac{1}{2} \times 13 \times 7 \times \sin \angle P \]

12)

\[ \text{Area} = \frac{1}{2} \times 9.7 \times 7 \times \sin 37^\circ \]

13)

\[ \text{Area} = \frac{1}{2} \times 8 \times 6 \]
Law of Cosines/Sines/Right Triangle Review

1. Two ranger stations located 10km apart receive a distress call from a camper. Electronic equipment allows them to determine that the camper is at an angle of 71° from the first station and 100° from the second. Which station is closer to the camper? How far away is it?

2. Mr. Thompson observes a student trying to climb out of a second story window and "escape" from 3rd Period. The angle of elevation of his line of sight to the student is 22°. The angle of elevation of his line of sight to the top of the school is 46°. If Mr. Thompson stands 20 feet from the base of Cox Mill HS, how far from the top of the building is the student?

3. The distances from a boat B to two seagulls on the shore are 100m and 80m respectively. If $B=55°$, how far would one seagull have to walk to meet the other seagull?

4. A damsel is in distress and is being held captive in a tower. Her knight in shining armor is on the ground below with a ladder. When the knight stands 15 feet from the base of the tower and looks up at his precious damsel, the angle of elevation to her window is 55 degrees. How long does the ladder need to be to reach the window?
Law of Cosines/Sines/Right Triangle Review

5. Ships A and B leave port at the same time and sail on straight paths making an angle of 60° with each other. How far apart are the ships at the end of 3 hours if the speed of ship A is 25 km/h and that of ship B is 15 km/h?

6. The sides of a triangle have lengths 10 cm, 9 cm, and 3 cm. Find the largest angle.

7. A 12 meter flagpole makes a 9 meter long shadow at a certain time of day. If you were to stand at the tip of the shadow, what would be the angle of elevation to the top of the pole?

8. Suppose you’re flying a kite and it gets caught at the top of a tree. You’ve let out all 100 feet of string from the reel and the angle that the string makes with the horizontal (the ground) is 15 degrees. If you are currently holding the kite string 4 feet above the ground, how tall is the tree?