Thread 4 Review: Similar Triangles and Trigonometry

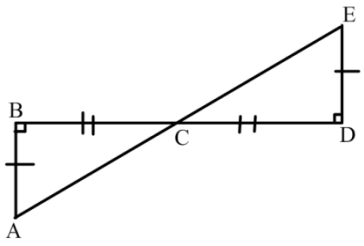
Complete all questions on separate sheets of lined paper.

On the unit test, you are welcome to use the sine, cosine, and tangent tables if you prefer.

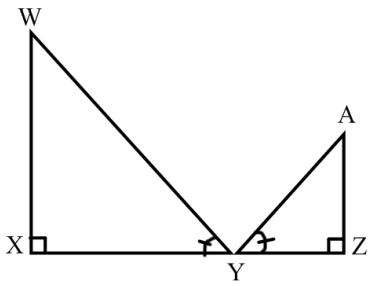
Problems

1. Decide if the triangles are similar or congruent. State your reasoning using formal proofs.

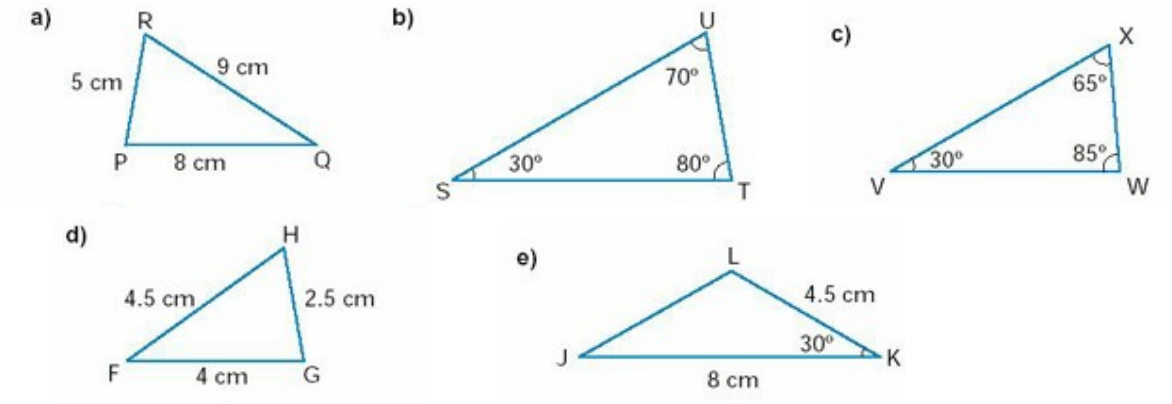
a)



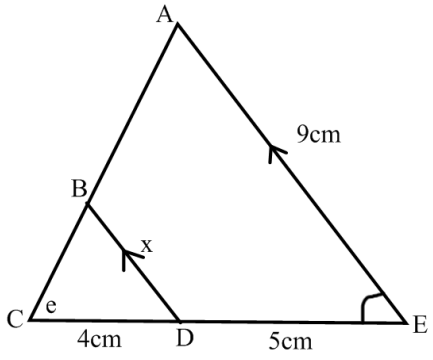
b)



2. Determine which of the triangles are similar. State your reasoning using formal proofs.



3. If $\angle AEC = 70°$, what is the measure of $\angle C$ and the length of BD?

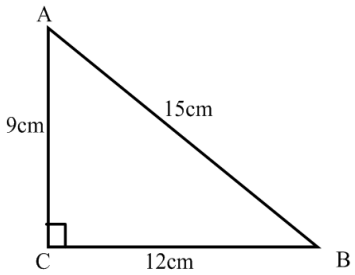


4. A triangle has two sides equal to two sides of another triangle, and has one angle equal to one of the angles of the other triangle. Explain why these two triangles may not be congruent.

5. Find the measure of the angle to the nearest degree:

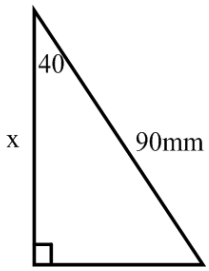
   a) $\sin(A) = \frac{9}{12}$ b) $\cos(B) = 0.1841$

6. State the three primary trigonometric ratios for $\angle B$.

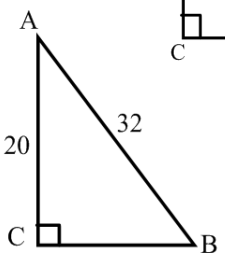


7. Solve each triangle:

   a)



   b)



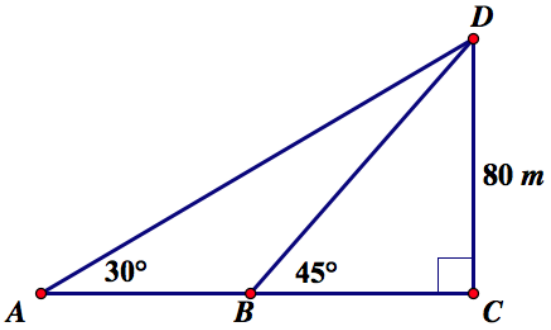
8. Is it possible for the opposite side of a right triangle to also be the adjacent side of a triangle? If so, explain how.

9. A person observes that from point A, the angle of elevation to the top of a cliff at D is 30° .

   Another person at point B, notes that the angle of elevation to the top of the cliff is 45° .

   If the height of the cliff is 80 m, find the distance between A and B.

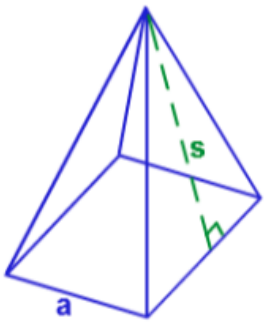
   Show the steps of your solution.



10. A square pyramid is a pyramid with a square base and four triangular lateral faces.

    The slant height, s, is the distance from the vertex of the pyramid along a lateral face to the midpoint of a base edge.

    If the slant height is 10 units long and an edge of the square is 12 units, what is the angle formed between the faces of the pyramid and its base?



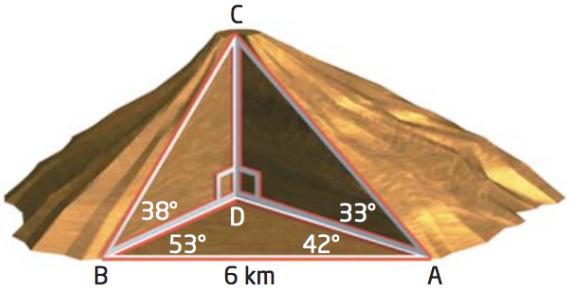
Square Pyramid

11. A ship is sighted at sea from two observation points on the coastline that are 60 km apart. The angle between the coastline and the ship at the first observation point is 43°. From the second observation point, the angle between the coastline and the ship is 55°. How far is the ship from the second observation point, to the nearest kilometre?

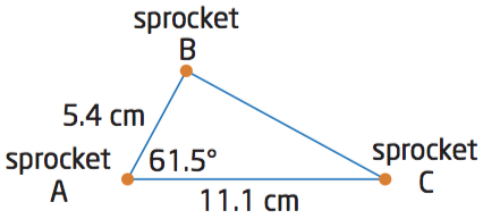
12. An airplane takes off from a runway near some mountains. The peak of a mountain is on the flight path 2.5km from the end of the runway. The mountain is 2000m high. What is the minimum angle of elevation needed to clear the top of the mountain?

13. In acute triangle ABC, a = 6.8 cm, b = 8.7 cm, and c = 9.6 cm. Solve the triangle.

14. Find the height of the mountain, to the nearest metre.



15. Connor is building a toy model of a track-type bulldozer. Three sprockets for one of the tracks are to be assembled as shown.



    a. How far should sprocket C be placed from sprocket B, to the nearest tenth of a centimetre?

    b. Find the interior angles of the triangle formed by these sprockets, to the nearest tenth of a degree.

Additional Problems

For optional additional review, all questions in this file can be completed.
↪ Short link: `https://tinyurl.com/36tucmep`

Note that final answers are given on the last page of that external file.

Be sure to check your work.