Lesson 3 Assignment

Sine Law and Cosine Law Applications

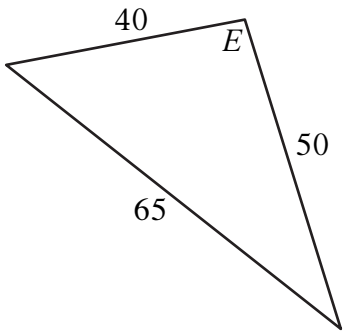
Work slowly and carefully. If you are having difficulty, go back and review the appropriate *Lesson*.

For full marks, show all calculations, steps, and/or explain your answers.

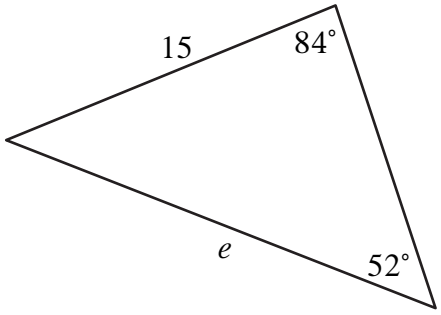
Total: 20 marks.

1. State whether the sine law or the cosine law is the best choice to solve for side e or $\angle E$. Do not solve. If it impossible to solve for the missing information, state "neither." Explain.

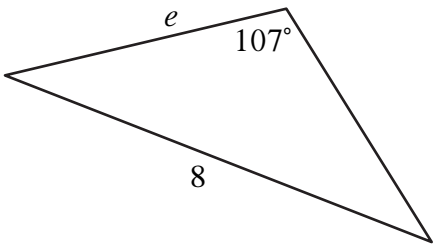
(1) a.



(1) b.



(1) c.



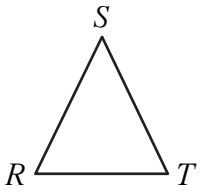
(1) _____ 2. What information do you need to know about a triangle to use the sine law?

A. two angles and two sides
B. two sides and any angle
C. all the sides
D. all the angles

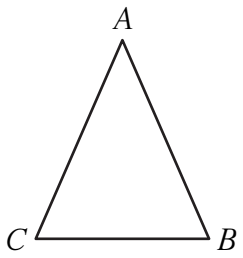
(1) _____ 3. What information do you need to know about a triangle to use the cosine law?

A. two angles and any side
B. two sides and any angle
C. all the sides
D. all the angles

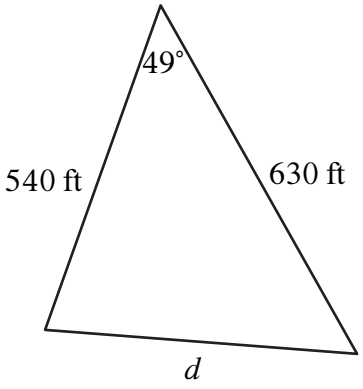
(1) 4. In $\triangle RST$, the values of side s and $\angle T$ are known. State one piece of information you need to know if you want to use the sine law to solve the triangle.



(1) 5. In $\triangle ABC$, the values of sides a and c are known. State one piece of information you need to know if you want to use the cosine law to solve the triangle.



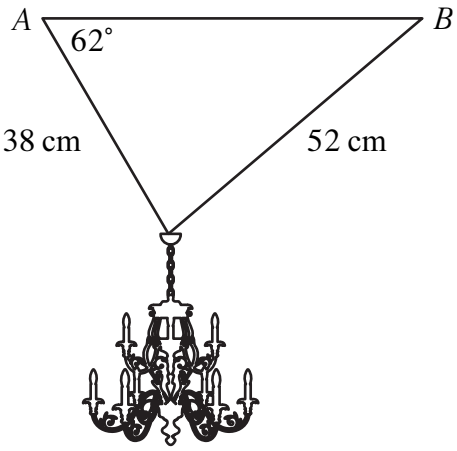
6. A triangular lot sits at the corner of two streets that intersect at an angle of $49°$. One side of the lot is 540 ft and the other side is 630 ft.



(1) a. Based on the information provided in the diagram, should the sine law or the cosine law be used to find the length of the third side of the lot?

(2) b. How long is the third side of the lot? Express your answer to the nearest tenth of a foot.

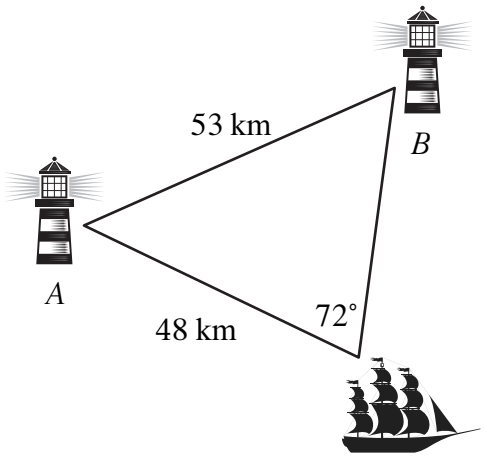
7. A chandelier is suspended on the ceiling by two chains. One chain is $38\ \text{cm}$ long and makes an angle of 62° with the ceiling. The other chain is $52\ \text{cm}$ long.



(1) a. Based on the information provided in the diagram, should the sine law or the cosine law be used to find the angle the longer chain makes with the ceiling $(\angle B)$?

(2) b. What angle does the longer chain make with the ceiling $(\angle B)$ to the nearest degree?

8. A boat leaves lighthouse A and travels $48\ \text{km}$. The boat is spotted from lighthouse B, which is $53\ \text{km}$ away from lighthouse A. The boat forms an angle of 72° between both lighthouses.

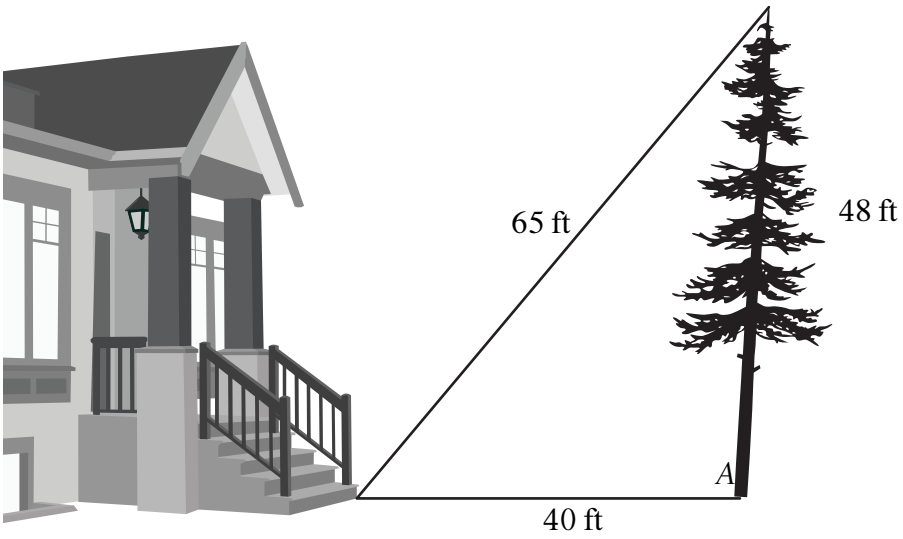


(1) a. Based on the information provided in the diagram, should the sine law or the cosine law be used to find the angle formed at lighthouse B?

(2) b. What is the angle formed at lighthouse B to the nearest degree?

(1) c. What is the angle formed at lighthouse A?

9. After a storm, a 48 ft coniferous tree leans away from a house. The base of the tree is 40 ft from the steps of the house. The top of the tree is 65 ft from the steps of the house.



(1) a. Based on the information provided in the diagram, should the sine law or the cosine law be used to find the angle that the tree makes with the ground.

(2) b. What is the angle that the tree makes with the ground $(\angle A)$ to the nearest degree?