

Section 11.4 Notes

Know when to use the Law of Sines

Solve triangles using the Law of Sines

Applications of the Law of Sines

The Law of Sines:

AAS: Angle-Angle-Side

ASA: Angle-Side-Angle

ASS: Angle-Side-Side

SAS: Side-Angle-Side

SSS: Side-Side-Side

Solve triangles using the Law of Sines

Step 1:

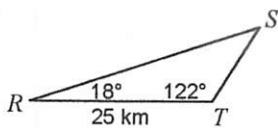
Step 2:

Step 3:

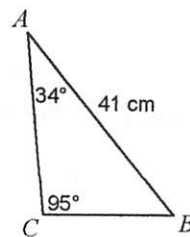
Use the Law of Sines to solve the triangle:

Round sides to the nearest tenth and angles to nearest whole number.

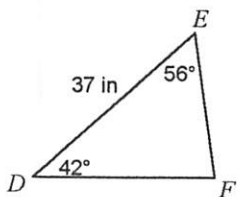
1)



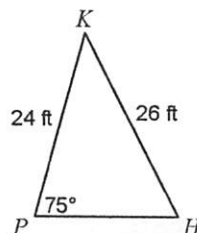
2)



3)



4)



5) $m\angle A = 145^\circ$, $a = 23$ mi, $c = 9$ mi

6) $m\angle B = 113^\circ$, $m\angle C = 14^\circ$, $b = 38$ m

7) $m\angle C = 117^\circ$, $m\angle B = 41^\circ$, $b = 28$ yd

8) $m\angle B = 136^\circ$, $m\angle C = 31^\circ$, $a = 10$ yd

9) Jack is on one side of a 200-foot-wide canyon and Jill is on the other. Jack and Jill can both see the trail guide at an angle of depression of 40 degrees. How far are they from the trail guide?

10) Three boats are at sea: Jenny (J), Kayla (K), and Larry (L). The crew of J can see both K and L. The angle between the line of sight to K and the line of sight to L is 45 degrees. If the distance between J and K is 2 miles and the distance between K and L is 4 miles, what is the distance between J and L?

Section 11.4 Notes

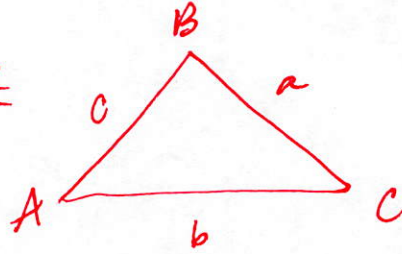
Know when to use the Law of Sines

Solve triangles using the Law of Sines

Applications of the Law of Sines

The Law of Sines:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$



AAS: Angle-Angle-Side Law of Sines

ASA: Angle-Side-Angle Law of Sines

ASS: Angle-Side-Side: Law of Sines

SAS: Side-Angle-Side Law of Cosines

SSS: Side-Side-Side Law of Cosines

Solve triangles using the Law of Sines

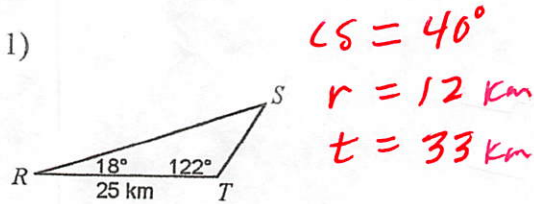
Step 1: Draw a picture

Step 2: Solve for missing angle (sum angles = 180°)
or use law of sines w/proportion to find one angle

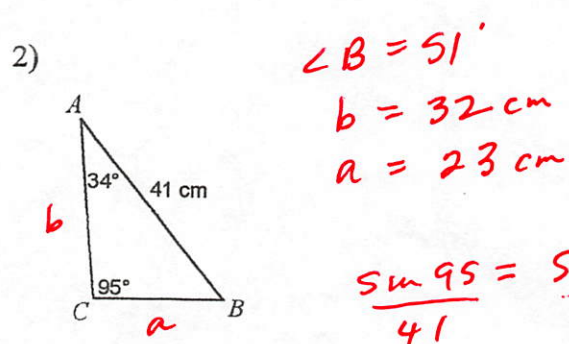
Step 3: Use law of sines to solve for missing sides

Use the Law of Sines to solve the triangle:

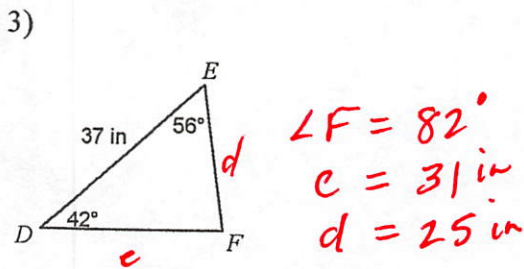
Round sides to the nearest tenth and angles to nearest whole number.



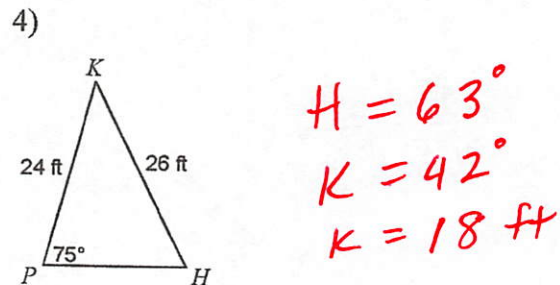
$$\frac{\sin 122}{t} = \frac{\sin 40}{25} = \frac{\sin 18}{r}$$



$$\frac{\sin 95}{41} = \frac{\sin 34}{a} = \frac{\sin 51}{b}$$

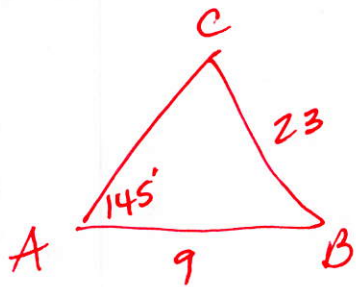


$$\frac{\sin 82}{37} = \frac{\sin 56}{c} = \frac{\sin 42}{d}$$



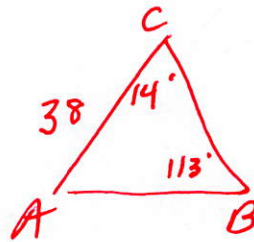
$$\frac{\sin 42}{K} = \frac{\sin 75}{26} = \frac{\sin H}{24}$$

5) $m\angle A = 145^\circ$, $a = 23$ mi, $c = 9$ mi



$\angle C = 13^\circ$
 $\angle B = 22^\circ$
 $b = 15$ mi.

6) $m\angle B = 113^\circ$, $m\angle C = 14^\circ$, $b = 38$ m

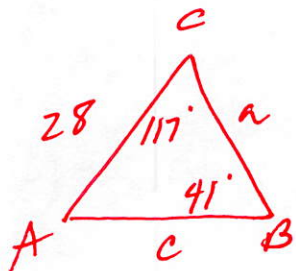


$\angle A = 53^\circ$
 $a = 33$ m
 $c = 10$ m

$$\frac{\sin 113}{38} = \frac{\sin 14}{c} = \frac{\sin 53}{a}$$

$$\frac{\sin 22}{b} = \frac{\sin 145}{23} = \frac{\sin c}{9}$$

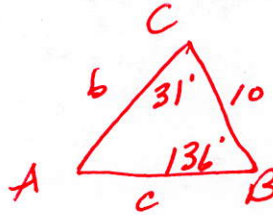
7) $m\angle C = 117^\circ$, $m\angle B = 41^\circ$, $b = 28$ yd



$\angle A = 22^\circ$
 $a = 16$ yd
 $c = 38$ yd.

$$\frac{\sin 41}{28} = \frac{\sin 22}{a} = \frac{\sin 117}{c}$$

8) $m\angle B = 136^\circ$, $m\angle C = 31^\circ$, $a = 10$ yd

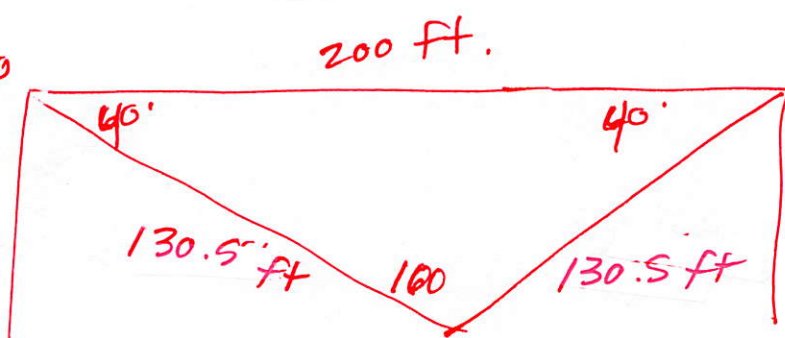


$\angle A = 13^\circ$
 $b = 30.9$ yd
 $c = 22.9$ yd.

$$\frac{\sin 13}{10} = \frac{\sin 136}{b} = \frac{\sin 31}{c}$$

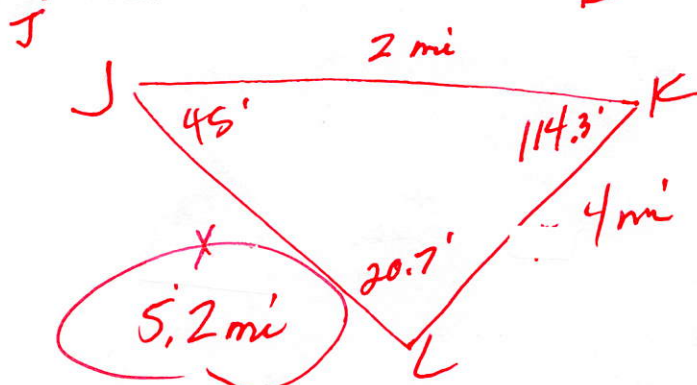
9) Jack is on one side of a 200-foot-wide canyon and Jill is on the other. Jack and Jill can both see the trail guide at an angle of depression of 40 degrees. How far are they from the trail guide?

$$\frac{\sin 100}{200} = \frac{\sin 40}{x}$$



130.5 ft

10) Three boats are at sea: Jenny (J), Kayla (K), and Larry (L). The crew of J can see both K and L. The angle between the line of sight to K and the line of sight to L is 45 degrees. If the distance between J and K is 2 miles and the distance between J and L is 4 miles, what is the distance between K and L?



$$\frac{\sin 45}{4} = \frac{\sin L}{2}$$

$$\frac{\sin 114.3}{x} = \frac{\sin 45}{4}$$