$h = b \sin A$

Lesson 3.7 - The Law of Sines (practice)

State the number of possible triangles that can be formed using the given measurements.

$h = 20 \sin 31 = 10.3$

1) $m\angle A = 31°, c = 20$ mi, $a = 16$ mi

→ a is between h and b (c)

Two Triangles

2) $m\angle B = 82°, a = 34$ m, $b = 22$ m

$h = 33.7$ → $a < h$ ∴ No Triangles (0)

3) $m\angle B = 110°, b = 11$ m, $a = 4$ m

$a > b$ ∴ one triangle

4) $m\angle A = 64°, c = 33$ in, $a = 32$ in

$h = 29.7$ → Two triangles

Find each measurement indicated. Round your answers to the nearest tenth.

5) $m\angle A = 64°, m\angle B = 98°, a = 29$ mi
Find b

32 miles

6) $m\angle A = 57°, c = 35$ cm, $a = 33$ cm → 2 Δ's
Find b

34.1cm or 4cm

7) $m\angle C = 128°, b = 35$ in, $c = 35$ in
Find a

Not a triangle

8) $m\angle C = 90°, m\angle B = 30°, b = 15$ in
Find c

30inches

9) In $\triangle TRS, m\angle S = 118°, s = 16$ ft, $r = 5$ ft
Find $m\angle R$

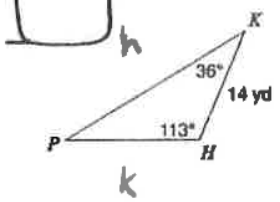
16°

10) In $\triangle KHP, m\angle K = 27°, p = 35$ m, $k = 18$ m
Find $m\angle P$

62° or 118°

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

13)

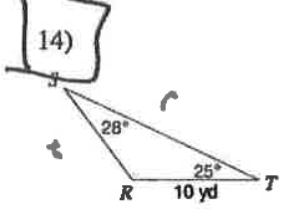


$\angle P = 31°$

Side $h = 25$ yds

Side $k = 16$ yds

14)



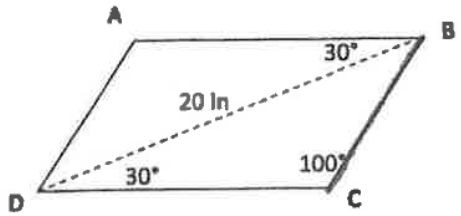
$\angle R = 127°$

$t =$ 9 yds

$r = 17$ yds

Lesson 3.7 - The Law of Sines (practice)

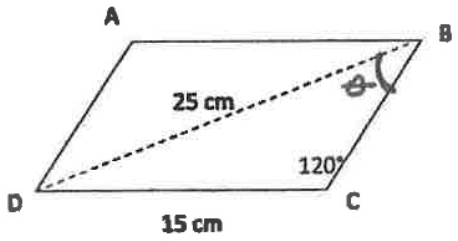
17. For parallelogram ABCD below find BC to the nearest tenth.



$\frac{\sin 30}{BC} = \frac{\sin 100}{20}$

$BC = 10.15$

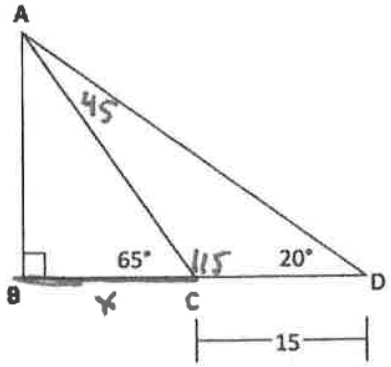
18. For parallelogram ABCD below find $m\angle DBC$ to the nearest whole degree.



$\frac{\sin\theta}{15} = \frac{\sin 120}{25}$

$\sin^{-1}\theta = \left(\frac{15\sin 120}{25}\right) = 31.3^\circ$

19. For the figure below find BC to the nearest whole number. CD=15.



$\frac{\sin 20}{AB} = \frac{\sin 45}{15}$

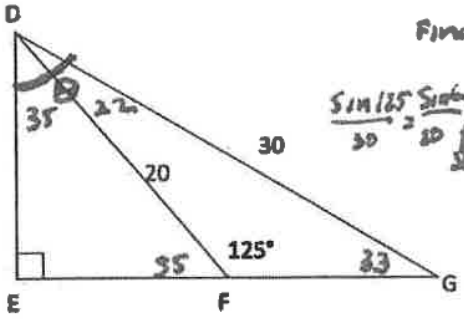
$AB = 7.25$

$\cos 65 = \frac{x}{7.25}$

$x = 3.06$

20. For the figure below find $m\angle EDG$ to the nearest whole degree.

Find $\angle G$ then, Find $\angle FDG$



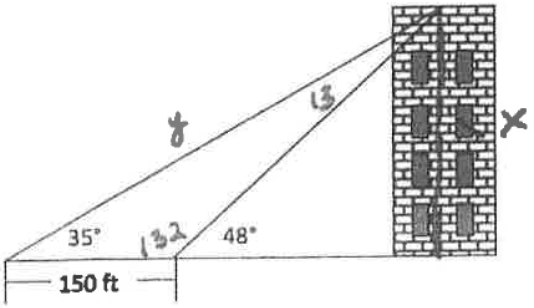
$\frac{\sin 125}{30} = \frac{\sin G}{20}$

$\angle G = 33^\circ$

$\angle FDG =$

$\theta = 35 + 22 = 57^\circ$

21. Find the height of the building in the figure below to the nearest foot.



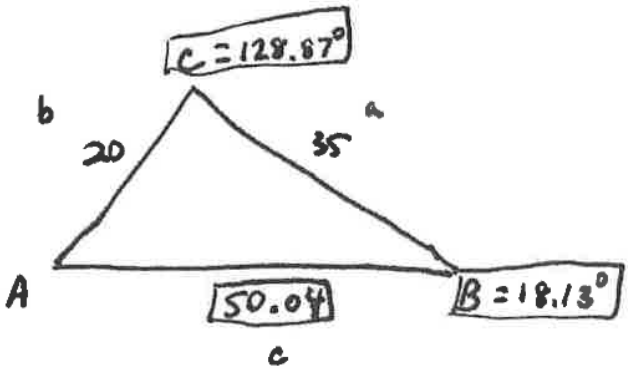
$\frac{\sin 132}{y} = \frac{\sin 13}{150} \rightarrow y = 49.55$

$\sin 35 = \frac{x}{49.55} \rightarrow x = 28.4\text{ ft}$

Lesson 3.7 - The Law of Sines (practice)

Determine the number of possible triangles that exist given the following information: **a = 35, b = 20 and A = 33°.** If more than one triangle exists, solve for missing sides/angles for both triangles.

One △



∠B = 18.13

∠C = 128.87

c = 50.04

Determine the number of possible triangles that exist given the following information: **a = 18, b = 32 and A = 65°.** If more than one triangle exists, solve for missing sides/angles for both triangles.

No Triangles a < b

h = 29 →

a < h

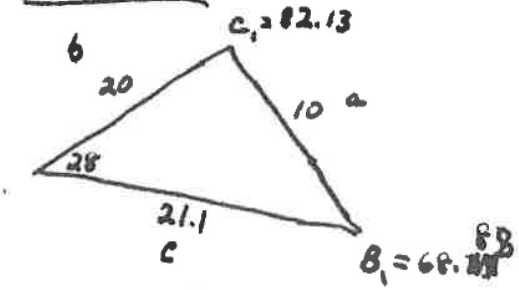
Determine the number of possible triangles that exist given the following information: **a = 10, b = 20 and A = 28°.** If more than one triangle exists, solve for missing sides/angles for both triangles.

Two Triangles

h = 9.39

h < a < b

Triangle 1

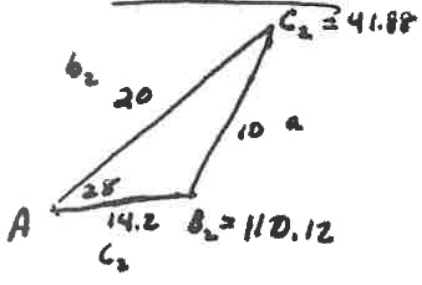


∠B₁ = 69.88

∠C₁ = 82.12

c = 21.1

Triangle 2



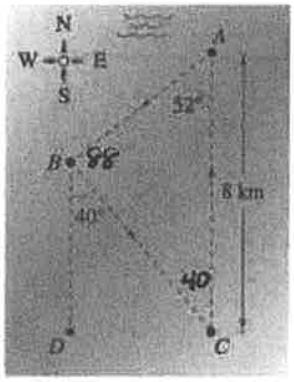
∠B₂ = 110.12

∠C₂ = 41.88

c₁ = 14.2

Lesson 3.8 - The Law of Sines (practice)

The course for a boat race starts at point A and proceeds in the direction S 52° W to point B, then in the direction S 40° E to point C, and finally back to A, as shown in Figure 6.9. Point C lies 8 kilometers directly south of point A. Approximate the total distance of the race course.



$\frac{AB}{\sin 40} = \frac{8}{\sin 88} \rightarrow AB = 16.6$

$\frac{BC}{\sin 52} = \frac{8}{\sin 88} \rightarrow BC = 6.3$

Final Perimeter of ABC

$AC = 8$

$AB = 16.6$

$BC = 6.3$

30.9 km

20.83°

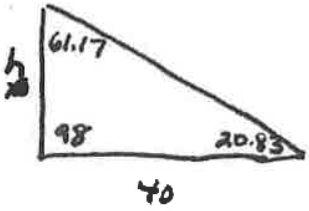
Height You are standing 40 meters from the base of a tree that is leaning 8° from the vertical away from you. The angle of elevation from your feet to the top of the tree is 20° 50′.

(a) Draw a triangle that represents the problem. Show the known quantities on the triangle and use a variable to indicate the height of the tree.

(b) Write an equation involving the unknown height of the tree.

(c) Find the height of the tree.

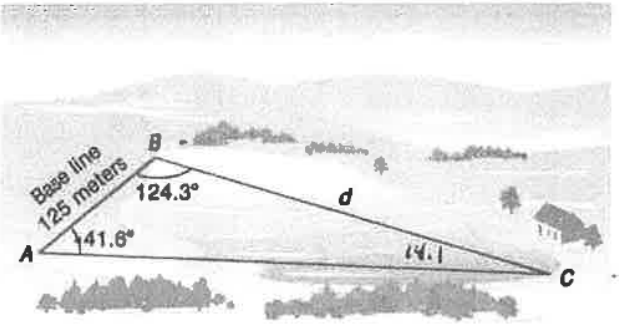
a)



b) $\frac{40}{\sin 61.17} = \frac{h}{\sin 20.83}$

c) $h = 16.23\text{m}$

To measure the length d of a lake (see Fig. 7), a baseline AB is established and measured to be 125 meters. Angles A and B are measured to be 41.6° and 124.3°, respectively. How long is the lake?



Find BC

$\frac{125}{\sin 14.1} = \frac{BC}{\sin 41.6}$

$BC = 340.67\text{m}$