Today's Plan:

Learning Target (standard): I will use the Law of Cosines to solve triangles.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

Take a few minutes to go over your application problems with one another. Please let me know if you have questions. When you are ready, leave your assignment on your desk and please go to the board.

30) $76.6\,ft$

31) $1490.5\,ft$

32) $629.9\,ft$

34) $1053.2\,ft$

36) $0.31\text{min} \approx 19\text{sec}$

38) $6.8 inches$

40a) $3.21 miles$

b) $3.78 miles$

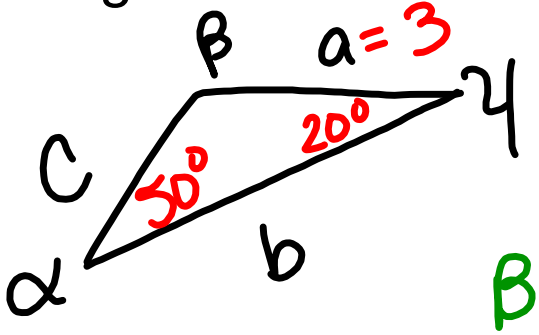
c) $3.10 miles$

Solve the triangle:

$\alpha = 50°$

$\gamma = 20°$

$a = 3$



AAS

$\beta = 180° - 20° - 50°$

$\beta = 110°$

$\frac{\sin\alpha}{a} = \frac{\sin\gamma}{c}$

$\frac{\sin 50°}{3} = \frac{\sin 20°}{c}$

$c\sin 50° = 3\sin 20°$

$c = \frac{3\sin 20°}{\sin 50°}$

$c = 1.339$

$\frac{\sin\alpha}{a} = \frac{\sin\beta}{b}$

$\frac{\sin 50°}{3} = \frac{\sin 110°}{b}$

$b\sin 50° = 3\sin 110°$

$b = \frac{3\sin 110°}{\sin 50°}$

$b = 3.680$

$\beta = 110°$

$b = 3.680$

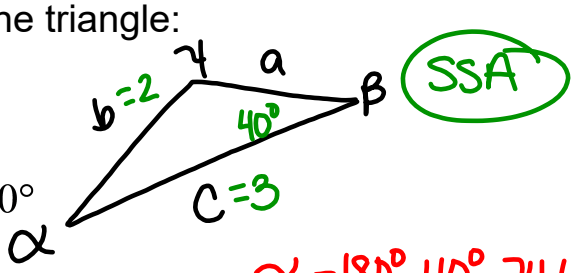
$c = 1.339$

Solve the triangle:

$b = 2$

$c = 3$

$\beta = 40°$



$\frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$

$\frac{\sin 40°}{2} = \frac{\sin\gamma}{3}$

$2\sin\gamma = 3\sin 40°$

$\sin\gamma = \frac{3\sin 40°}{2}$

$\sin\gamma = .9642$

$\gamma = \sin^{-1}(.9642)$

$\gamma_1 = 74.619°$

$\alpha_1 = 180° - 40° - 74.619°$

$\alpha_1 = 65.381°$

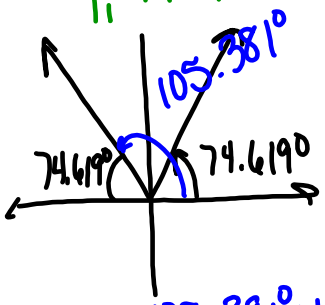
$\frac{\sin\alpha_1}{a_1} = \frac{\sin\beta}{b}$

$\frac{\sin 65.381°}{a_1} = \frac{\sin 40°}{2}$

$a_1 \sin 40° = 2\sin 65.381°$

$a_1 = \frac{2\sin 65.381°}{\sin 40°}$

$a_1 = 2.829$



$\gamma_2 = 105.381°$

$105.381° + 40° < 180$

2 triangles

$\alpha_2 = 180° - 40° - 105.381°$

$\alpha_2 = 34.619°$

$\frac{\sin\alpha_2}{a_2} = \frac{\sin\beta}{b}$

$\frac{\sin 34.619°}{a_2} = \frac{\sin 40°}{2}$

$a_2 \sin 40° = 2\sin 34.619°$

$a_2 = \frac{2\sin 34.619°}{\sin 40°}$

$a_2 = 1.768$

$\alpha_1 = 65.381°$

$\gamma_1 = 74.619°$

$a_1 = 2.829$

$\alpha_2 = 34.619°$

$\gamma_2 = 105.381°$

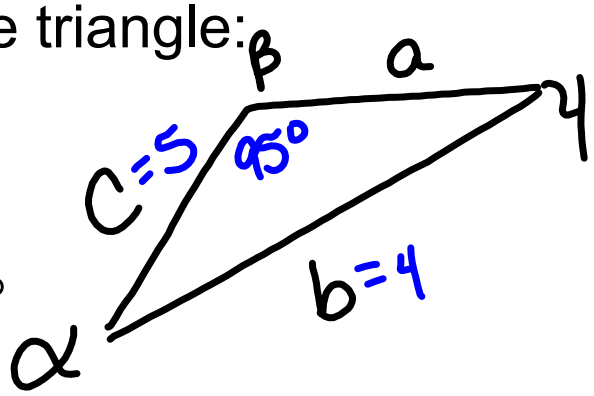
$a_2 = 1.768$

Solve the triangle:

$b = 4$

$c = 5$

$\beta = 95°$



SSA

$$\frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$$

$$\frac{\sin 95°}{4} = \frac{\sin\gamma}{5}$$

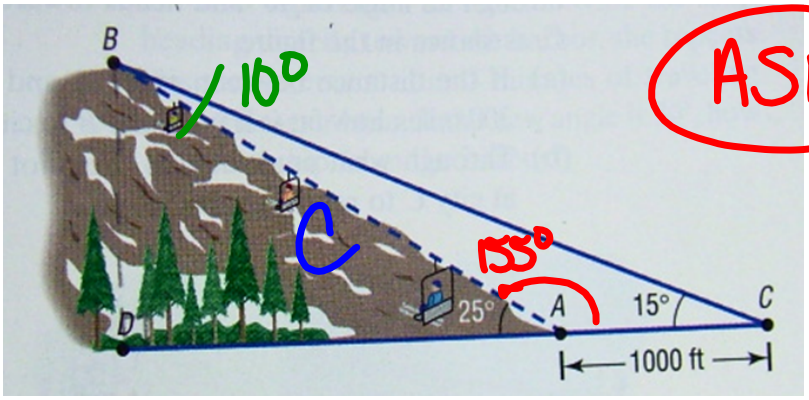
$$4\sin\gamma = 5\sin 95°$$

$$\sin\gamma = \frac{5\sin 95°}{4}$$

$$\sin\gamma = 1.245 > 1$$

no triangle

To find the length of the span of a proposed ski lift from A to B, a surveyor measures the angle DAB to be 25° and then walks off a distance of 1000 feet to C and measures the angle ACB to be 15°. What is the distance from A to B?



ASA

$$\frac{\sin B}{b} = \frac{\sin \gamma}{c}$$

$$\frac{\sin 10^\circ}{1000} = \frac{\sin 15^\circ}{c}$$

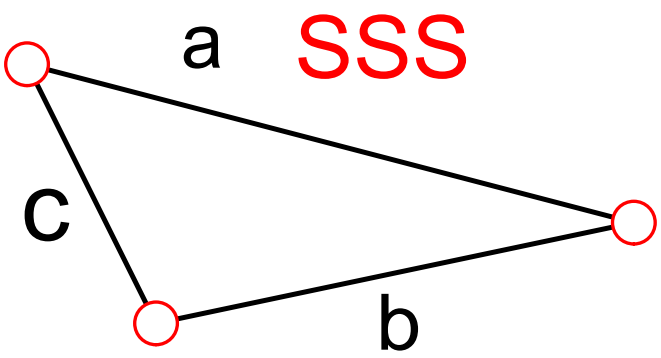
$$c \sin 10^\circ = 1000 \sin 15^\circ$$

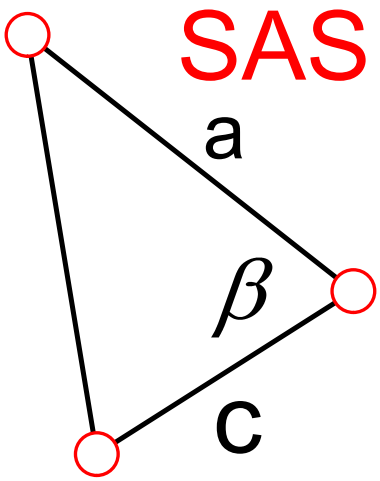
$$c = \frac{1000 \sin 15^\circ}{\sin 10^\circ}$$

$$c = 1490.479$$

A to B is 1490.479 ft

Law of Cosines:





Law of Cosines:

$$c^2 = a^2 + b^2 - 2ab\cos\gamma$$

$$b^2 = a^2 + c^2 - 2ac\cos\beta$$

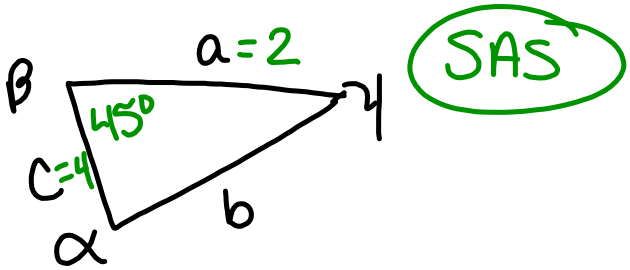
$$a^2 = b^2 + c^2 - 2bc\cos\alpha$$

Solve each triangle:

$\beta = 45°$

$a = 2$

$c = 4$



$b^2 = a^2 + c^2 - 2ac\cos\beta$

$b^2 = (2)^2 + (4)^2 - 2(2)(4)\cos 45°$

$b^2 = 4 + 16 - 11.3137$

$b^2 = 8.6863$

$b = 2.947$ $a^2 = b^2 + c^2 - 2bc\cos\alpha$

$(2)^2 = (2.947)^2 + 4^2 - 2(2.947)(4)\cos\alpha$

$4 = 8.6865 + 16 - 23.576\cos\alpha$

$-20.6865 = -23.576\cos\alpha$

$\cos\alpha = .8774$

$\alpha = \cos^{-1}(.8774)$

$\alpha = 28.665°$

$\gamma = 180° - 45° - 28.665°$

$\gamma = 106.335°$

Assignment:

p.546 #4-24 (by 4)

* Draw ALL appropriate diagrams! *