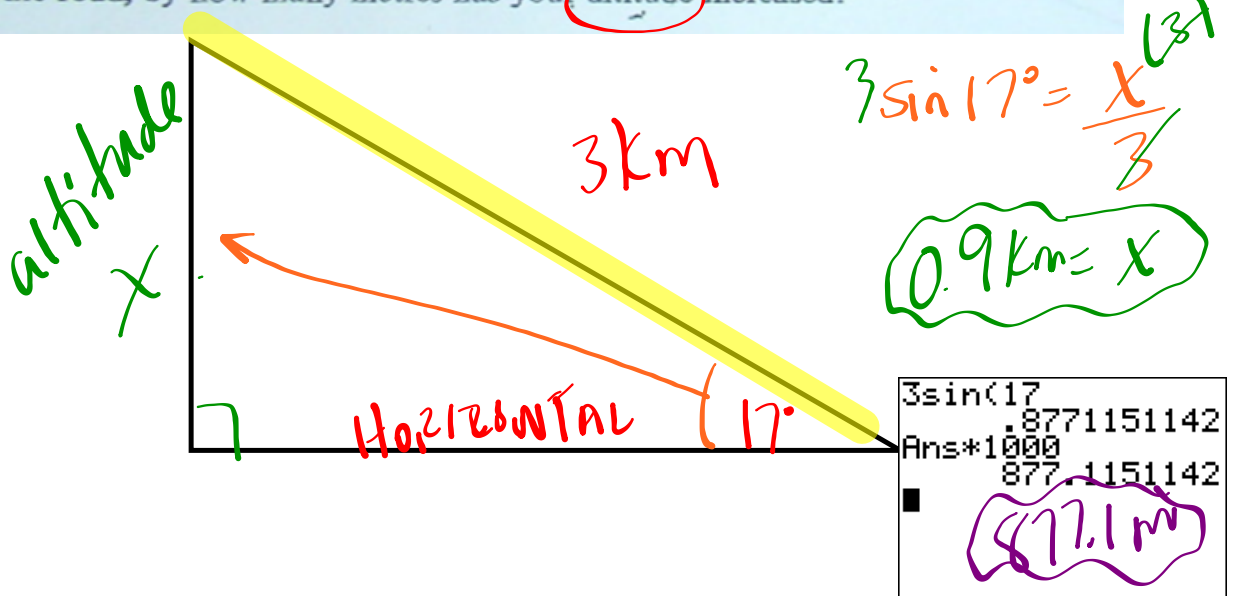
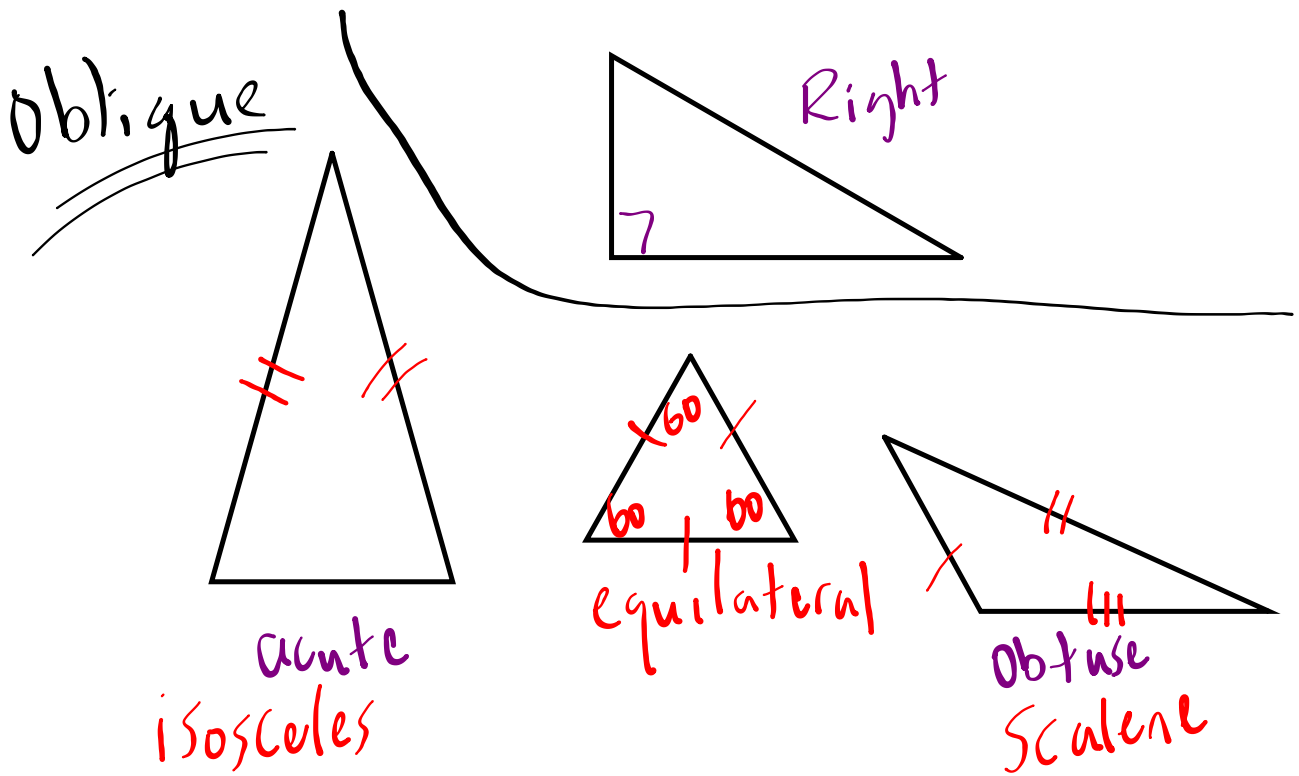


Hw: 10.7 → Solving
 Questions 10.8 → Application

(5)

5 A mountain road is inclined at 17° to the horizontal. If you travel 3 km up the road, by how many metres has your altitude increased?





Law of Sines

** Used when the triangle does not contain a right angle (Oblique Triangle)

** In order to use you must be given 1) an angle and an opposite side

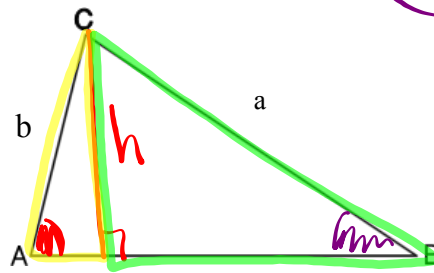
AND

2) any other side or angle

Lower case letters "a,b,c" represent side lengths

Upper case letters "A,B,C" represent angle measures

Let's derive the Law of Sines...



$$b \sin A = \frac{h}{b} b^c$$

$$a \sin B = \frac{h}{a} a^x$$

$$b \sin A = h$$

$$a \sin B = h$$

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

Law of Sines

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

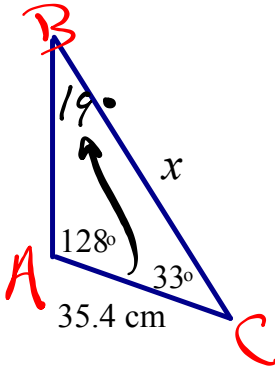
$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

"when looking for a side"

"when looking for an angle"



EXAMPLE #1 - Finding a side.

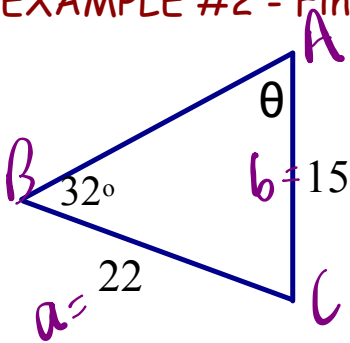


$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

$$\frac{x \sin 128^\circ}{\sin 128^\circ} = \frac{35.4 \sin 128^\circ}{\sin 19^\circ}$$

$$x = 85.7$$

EXAMPLE #2 - Finding an angle.



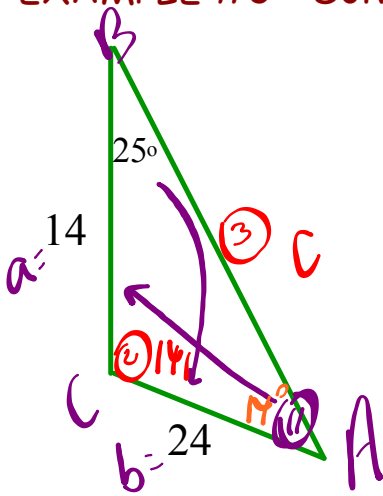
$$\frac{\sin A}{a} = \frac{\sin B}{b}$$

$$\frac{\sin \theta}{22} = \frac{\sin 32^\circ}{15}$$

$$\sin^{-1} \sin \theta = \sin^{-1} (0.7772)$$

$$\theta = 51^\circ$$

EXAMPLE #3 - Solve the triangle.



$$\textcircled{1} \frac{14 \sin A}{14} = \frac{14 \sin 25^\circ}{24}$$

$$\sin^{-1} \sin A = (0.2465)$$

$$\angle A = 14^\circ$$

$$\textcircled{2} \angle C = 180^\circ - 25^\circ - 14^\circ$$

$$\angle C = 141^\circ$$

$$\textcircled{3} \frac{c \sin 141^\circ}{\sin 141^\circ} = \frac{24 \sin 141^\circ}{\sin 25^\circ}$$

$$c = 35.7$$

Homework...

Worksheet - Law of Sines.doc



10.9: #1 - 6