Lesson 77 Objective: SWBAT use law of sines to solve for missing parts of triangles.

Kickoff

Complete questions 2, 6 & 14 WITHOUT A CALCULATOR on your homework :)

2) $\csc\theta = 2$

$\frac{1}{\sin\theta} = \frac{2}{1}$

$\sin\theta = \frac{1}{2}$

ref $\frac{\pi}{6}$ or 30

$\theta = 30$

$\theta = 180 - 30 = 150$

14) $\sin^2\theta = \sin\theta$

let $\sin\theta = x$

$x^2 = x$

$-x \quad -x$

$x^2 - x = 0$

$x(x-1) = 0$

$x = 0 \quad x = 1$

$\sin\theta = 0$ $\quad \sin\theta = 1$

$\theta = 0, 180, 360$ or $0, \pi$ $\quad \theta = 90$ or $\frac{\pi}{2}$

6) $(\cos\theta)(\tan\theta - \sqrt{3}) = 0$

$\cos\theta = 0 \quad \tan\theta - \sqrt{3} = 0$

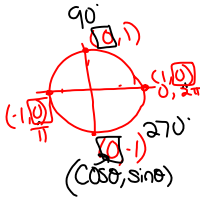
$\theta = 90, 270$ $\quad \tan\theta = \sqrt{3}$

ref 60

$\theta = 60$

$\theta = 180 + 60$

240



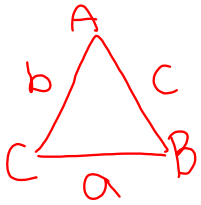
Law of Sines

Oblique triangles are triangles that have no right angles. The **Law of Sines** can be used to find missing sides or angles for these oblique triangles.

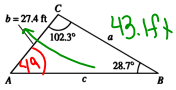
To apply the **Law of Sines**, you need to know the measure of at least one side and the measures of any two other parts of the triangle—two sides, two angles, or one angle and one side.

Law of Sines:

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



1) For the triangle shown, $C = 102.3°$, $B = 28.7°$, and $b = 27.4$ feet. Find the remaining angle and sides.



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

$\frac{27.4}{\sin 28.7} = \frac{a}{\sin 49}$

$a\sin 28.7 = 27.4\sin 49$

$\frac{a\sin 28.7}{\sin 28.7} = \frac{27.4\sin 49}{\sin 28.7}$

$a = 43.1$ ft

180 − 102.3 − 28.7 = 49

$\frac{27.4}{\sin 28.7} = \frac{c}{\sin 102.3}$

$c = \frac{27.4\sin 102.3}{\sin 28.7}$

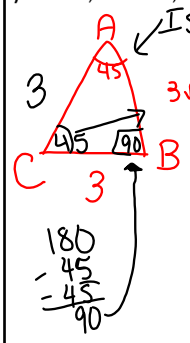
$c = 55.7$ ft

2) In ΔABC, $a = 10$, $\angle A = 30°$, and $\angle B = 50°$. Find side b to the nearest integer.

3) In ΔABC, $a = \sqrt{3}$, $\angle A = 60°$, and $\angle C = 90°$. Find the length of side c.

4) In ΔABC, m<A = 55, m<B = 20, and side a = 14. Solve the triangle.

5) In ΔABC, side a = 3, side c = $3\sqrt{2}$, and m<A = 45. Solve the triangle.



Isosceles right Δ!

Finding all missing parts

$\frac{3\sqrt{2}}{\sin C} = \frac{3}{\sin 45}$

$\frac{3\sin C}{3} = \frac{3\sqrt{2}\sin 45}{3}$

$\sin C = \frac{\sqrt{2}}{2}$

$C = 45°$

180 − 45 − 45 = 90

6) In the accompanying diagram of ΔABC, m<A = 30, m<C = 50, and AC = 13. Solve the triangle.