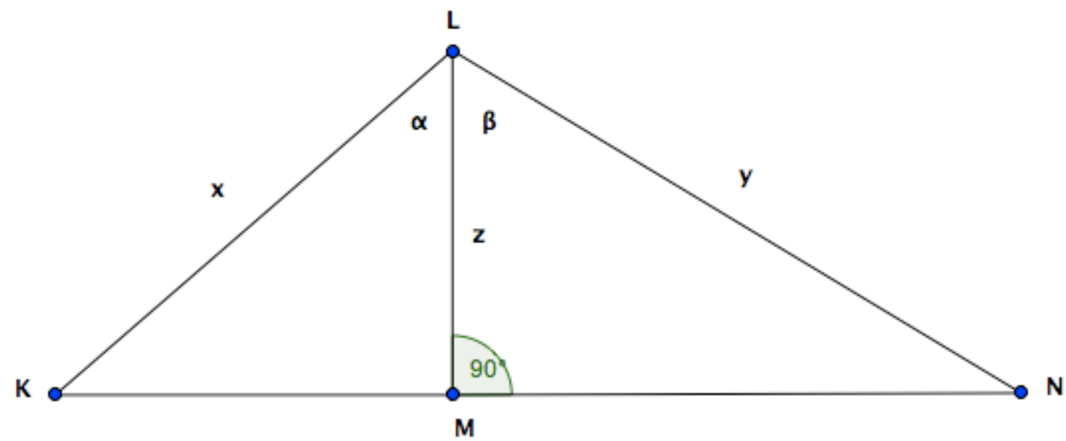
Precalculus Honor
Winkler

10.1 Angle Addition Formulas

Name ___________

Let's derive some new trig identities:

1. Confirm the following areas:



$A(\Delta KLM) = \frac{1}{2}xz\sin\alpha$

$A(\Delta NLM) = \frac{1}{2}yz\sin\beta$

$A(\Delta KLN) = \frac{1}{2}xy\sin(\alpha+\beta)$

2. Is it true that $A(\Delta KLM)$ + $A(\Delta NLM)$ = $A(\Delta KLN)$?

3. This must mean that $\frac{1}{2}xz\sin\alpha$ + $\frac{1}{2}yz\sin\beta$ = $\frac{1}{2}xy\sin(\alpha+\beta)$. Solve this equation for $\sin(\alpha+\beta)$. Your final equation should not have any x's, y's or z's in it.

4. Replace β with $-\beta$ and simplify to get an identity for $\sin(\alpha-\beta)$.

Now list all the angle addition formulas and chant the chant…

Find the following values. NO CALCULATOR.

1. $\sin 255^{\circ}$

2. $\cos 195^{\circ}$

3. $\sin 345^{\circ}$

4. $\sin \frac{19\pi}{12}$

5. $\cos \frac{-\pi}{12}$

6. $\sin 140^{\circ} \cos 20^{\circ} - \cos 140^{\circ} \sin 20^{\circ}$