Law of Sines Investigation



Look at the figure above, $∆ABC$, with height *h*.

1. Find an expression for *h* in terms of *a* and the sine of an angle. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Find an expression for *h* in terms of *b* and the sine of an angle. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Use algebra to show $\frac{\sin(A)}{a}=\frac{\sin(B)}{b}$.



Now look at the same $∆ABC$ using a different height *k*.

4. Find an expression for *k* in terms of *c* and the sine of an angle. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Find an expression for *k* in terms of *b* and the sine of an angle. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Use algebra to show $\frac{\sin(B)}{b}=\frac{\sin(C)}{c}$

7. Apply the transitive property to steps 3 and 6 to write the Law of Sines:

$$\frac{\sin(A)}{?}=\frac{?}{b}=\frac{?}{?}$$