Mathematics 10D

8.1 Sine Law

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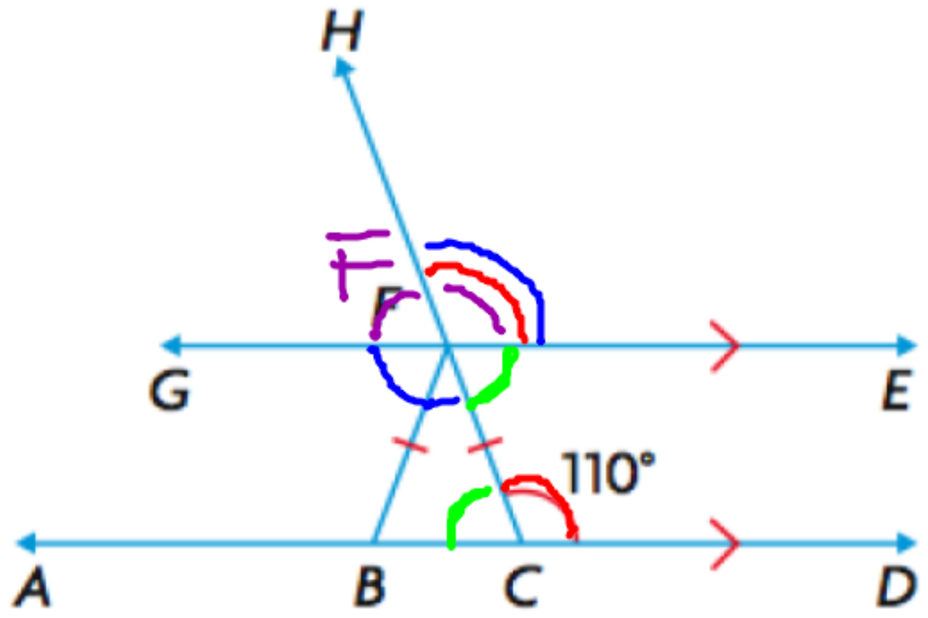
Goal: Explore the relationship between each side in an acute triangle and the sine of its opposite angle.

Acute triangle: 3 acute angles ($<90°$)

Supplementary Angles

$\angle A + \angle B = 180°$

e.g. $\angle GFH + \angle EFH = 180°$

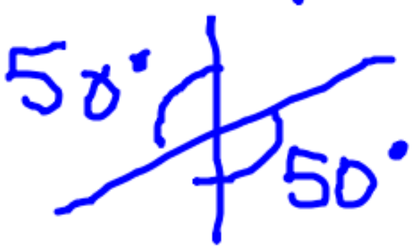


Alternate Angles

$\angle BCF = \angle CFE$

b/c GE || AD (parallel)

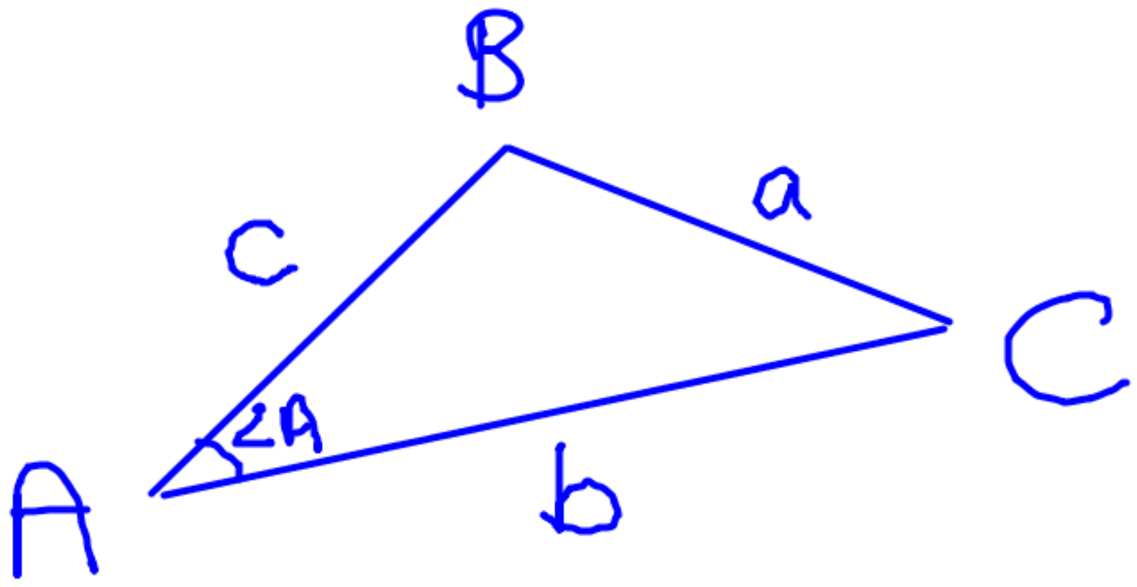
Opposite angle:



Corresponding Angles

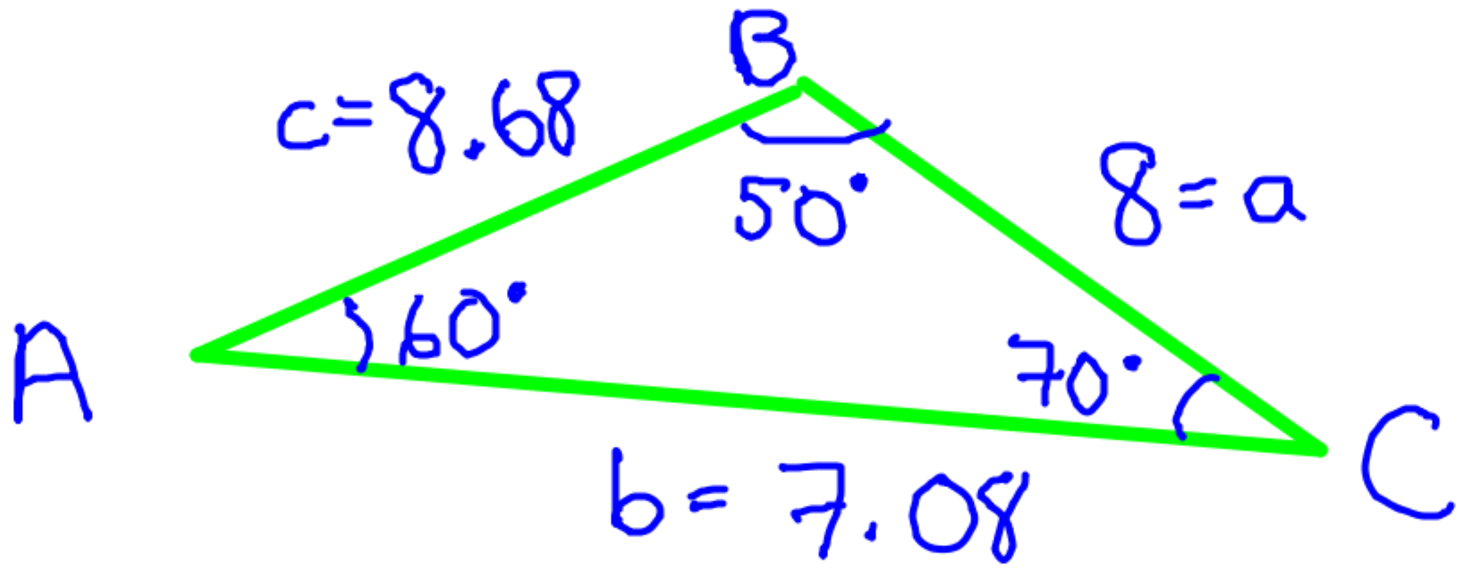
$\angle DCF = \angle EFH$ (b/c GE || AD)

Sine Law:



$$\frac{\text{opposite side}}{\sin(\angle)}$$

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



$$\frac{a}{\sin(\angle A)} = \frac{8}{\sin(60^\circ)} = \frac{8}{0.866} \approx 9.24$$

$$\frac{b}{\sin(\angle B)} = \frac{7.08}{\sin(50^\circ)} = \frac{7.08}{0.766} \approx 9.24$$

$$\frac{c}{\sin(\angle C)} = \frac{8.68}{\sin(70^\circ)} = \frac{8.68}{0.9397} \approx 9.24$$