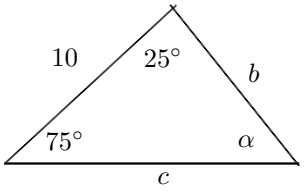
Law of Sines WS Name: Per:

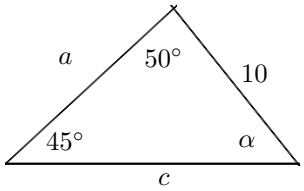
$$\frac{\sin\alpha}{a} = \frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$$



1. ASA
   Here only one possibility for α
   (a) Find α

   (b) Find b

   (c) Find c

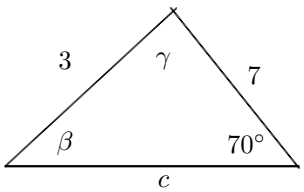


2. AAS (or SAA)
   Again, there is only one possibility for the missing angle
   (a) Find α

   (b) Find a

   (c) Find c

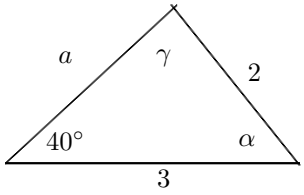
3. SSA(or ASS) Here is the tricky one. There is more than one possibility since two angles are missing. In fact there are 3: two solutions, one solution and no solution.



SSA (No Solution)

Find β

SSA (2 solutions)



(a) Find γ (we'll call it γ_1)

(b) Find the γ_2 (The supplement of γ_1)

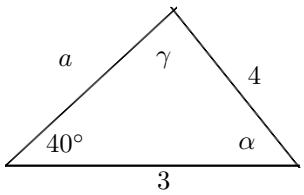
(c) Note whether $\gamma_2 + 40°$ is still under 180^0 (If it is over $180°$ then α has no possible size, so we only would consider γ_1)

(d) Find α_1 (based on γ_1)

(e) Find a_1 (based on α_1)

(f) Find α_2 (based on γ_2)

(g) Find a_2 (based on α_2)



SSA (One Solution)

(a) Find γ (we'll call it γ_1)

(b) Find the γ_2 (The supplement of γ_1)

(c) Note whether $\gamma_2 + 40°$ is still under 180^0 (If it is over $180°$ then α has no possible size, so we only would consider γ_1)

Answers **1.** $\alpha = 80,\ b = 9.81,\ c = 4.292$ **.** $\alpha = 85,\ a = 14.09,\ c = 10.83$
3. β impossible, $\frac{7\sin 70}{3} > 1$ **SSA 2 sol:** $\gamma_1 = 74.6\alpha_1 = 65.4,\ a_1 = 2.83$
$\gamma_2 = 105.38,\ \alpha_2 = 34.62,\ a_2 = 1.77$ **SSA 1 sol** $\gamma = 28.82,\ \alpha = 111.18a = 5.8$