1. Solve the triangle. If the triangle is impossible, explain. If there is more than one possible triangle, find both.

a. $A = 115°$, $B = 40°$, $c = 7$

Ans: $a = \dfrac{7\sin(115°)}{\sin(25°)}$

$b = \dfrac{7\sin(40°)}{\sin(25°)}$

b. $A = 22°$, $b = 5$, $c = 3$

Ans: $a = \sqrt{34 - 30\cos(22°)} \approx 2.5$

$m\angle B = \arccos\left(-\dfrac{16 - a^2}{6a}\right) \approx 131.1°$

$m\angle C = 180° - 22° - 131.1° \approx 26.9°$

c. $A = 92°$, $C = 41°$, $c = 10$

Ans: $m\angle B = 47°$, $a = \dfrac{10\sin 92°}{\sin 41°} \approx 15.23$,

$b = \dfrac{10\sin 47°}{\sin 41°} \approx 11.15$,

d. $a = 8$, $b = 5$, $c = 10$

Ans: $m\angle A = \arccos\left(\dfrac{61}{100}\right) \approx 52.4°$

$m\angle B = \arccos\left(\dfrac{139}{160}\right) \approx 29.7°$

$m\angle C = \arccos\left(-\dfrac{11}{80}\right) \approx 97.9°$

e. $A = 50°$, $a = 10$, $b = 12$

Ans: Two possible triangles. Triangle 1:

$m\angle B = \arcsin\left(\dfrac{6}{5}\sin(50°)\right) \approx 66.8°$

$m\angle C = 180° - 50° - \arcsin\left(\dfrac{6}{5}\sin(50°)\right) \approx 63.2°$

$c = \dfrac{10\sin(63.2°)}{\sin 50°} \approx 11.65$

Triangle 2:

$m\angle B = 180° - \arcsin\left(\dfrac{6}{5}\sin(50°)\right) \approx 113.2°$

$m\angle C = 180° - 50° - 113.2° \approx 16.8°$

$c = \dfrac{10\sin(16.8°)}{\sin 50°} \approx 3.77$

f. $A = 46°$, $B = 76°$, $b = 5$

Ans: $m\angle C = 58°$

$a = \dfrac{5\sin 46°}{\sin 76°} \approx 3.7$

$c = \dfrac{5\sin 58°}{\sin 76°} \approx 4.37$