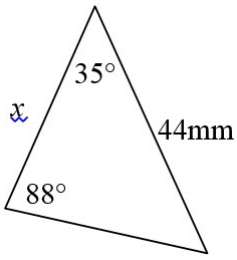
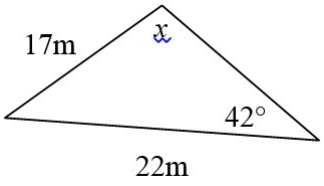
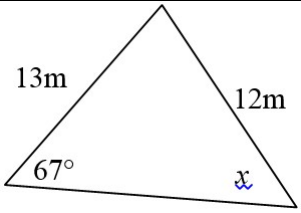
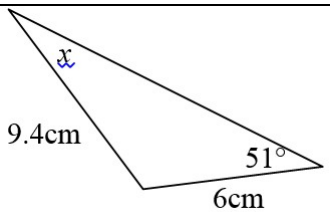
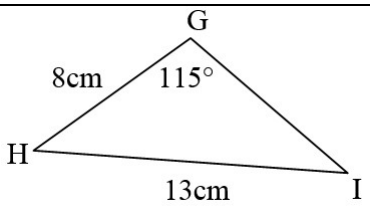
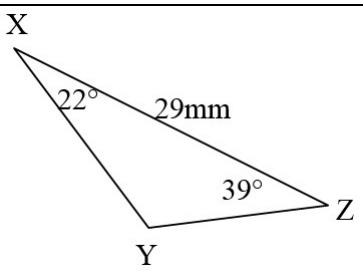
Name:_____ Date:_____

Math 10/11 Honours Section 4.5 Ambiguous Case of Sine Law

1. Given each equation, solve for all values of θ where $0 \le \theta \le 360^\circ$. Note: There are two angles!!

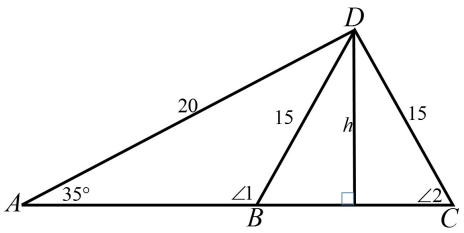
a) $\sin\theta = \frac{2}{3}$ $\theta_1 =$ ____ $\theta_2 =$ ____	b) $\sin\theta = \frac{4}{5}$ $\theta_1 =$ ____ $\theta_2 =$ ____	c) $\sin\theta = -0.55$ $\theta_1 =$ ____ $\theta_2 =$ ____
d) $\sin\theta = \frac{-\sqrt{2}}{2}$ $\theta_1 =$ ____ $\theta_2 =$ ____	e) $\sin\theta = \frac{-\sqrt{3}}{2}$ $\theta_1 =$ ____ $\theta_2 =$ ____	f) $\sin\theta = \frac{4}{\sqrt{7}}$ $\theta_1 =$ ____ $\theta_2 =$ ____

2. Given each of the following triangles, indicate whether if there would be an ambiguous case. State the reason why or why not:

3. Given each triangle, find the missing values and show all your work

Find the value of $\angle 1$, $\angle 2$, h, BC, *and* AB



$\angle 1 =$ _____ $\angle 2 =$ _____ $h =$ _____ $BC =$ _____ $AB =$ _____

4. Given that length MN is 31m, MO is 38m and angle MNO is 62degrees. Draw a diagram for triangle MON and then find the value of $\angle MON, \angle OMN,$ *and* $\overline{ON}$

$\angle MON =$ _____ (ACUTE) $\angle OMN =$ _____ $ON =$ _____

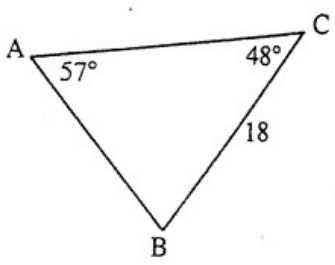
$\angle MON =$ _____ (OBTUSE) $\angle OMN =$ _____ $ON =$ _____

e) Triangle STU has side TU = 36, US = 42, and angle UST = 55degrees. Draw a diagram for the triangle and consider all cases. Find the length and angles below:

$\angle STU =$ _____ (ACUTE) $\angle T =$ _____ $ST =$ _____

$\angle STU =$ _____ (OBTUSE) $\angle T =$ _____ $ST =$ _____

5. Find the area of the following triangle.



6. A lighthouse at point Q is 20 km from a yacht at point R and 16 km from a sailboat at point S. From the yacht, the lighthouse and the sailboat are separated by an angle of $39°$

a) Is it necessary to consider the ambiguous case? Explain.

b) Sketch all possible diagrams for this situation.

c) Determine all possible the distances from the yacht to the sailboat, to the nearest tenth of a kilometre.

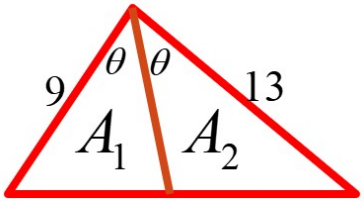
7. Jason and Sammy are part of a scientific team studying clouds. The team is about to launch a weather balloon into an active part of the cloud. Jason's rope is 15.4 m long and makes an angle of $42°$ with the ground. Belle's rope is 12.9 m long.

a) Is it necessary to consider the ambiguous case? Explain.

b) Sketch all possible diagrams for this situation.

c) Determine all possible the distances between Jason and Sammy to the nearest tenth of a meter.

8. Given the following triangle with an area of 200units^2, what is the area of A_1 and A_2 ?



9. Trapezoid ABCD has $AD \parallel BC$, $BD = 1$, $\angle DBA = 23°$ and $\angle BDC = 46°$. The ratio of $BC : AD$ is $9:5$. What is the length of CD? (AMC12)