

1. Congratulations! You are a land surveyor! What you make is not important; it is what you measure outside that matters. Find a partner for your land surveying firm and get to work!
2. Walking down lake, you see an island for development. Should you swim out to it? Looks can be deceiving! In order to cross, you must know the exact distance from the shore to the island. Using the tape measure and a protractor, find the distance.

• Law of Sines

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

- a. If you make a triangle, what kind of triangle did you make without ever crossing the lake?

• Law of Cosines

$$a = \sqrt{b^2 + c^2 - 2bc \cdot \cos A}$$

$$A = \cos^{-1} \left(\frac{b^2 + c^2 - a^2}{2bc} \right)$$

- b. Using your partner as a reference point, what angle do you make with a point on the island?

3. You made it to the island! Hooray!!! However, other land developers are scoping out your island! Without touching their property, claim your own property and find the area of that land. What shape did you make? If it's cooler than a triangle, you will be cooler than ice. You'll be ice cold. **Provide a sketch of your property below in addition to the measurements.**

What kind of triangle do you have? (SAS, SSS, ASA, SSA, AAS) _____

• Heron's Formula SSS

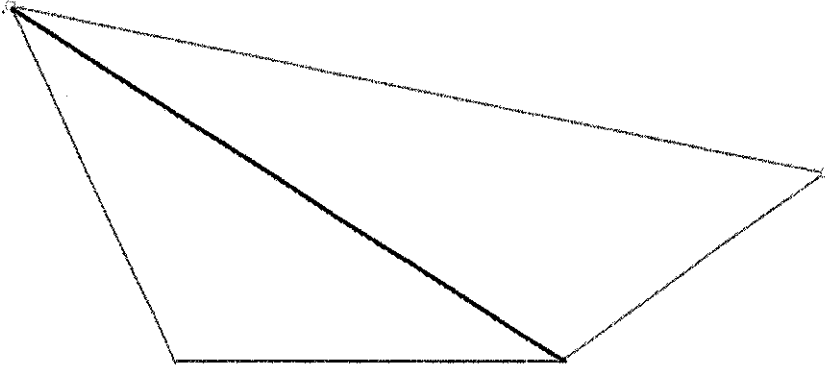
$$\textcircled{1} s = \frac{a+b+c}{2}$$

$$\textcircled{2} \text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

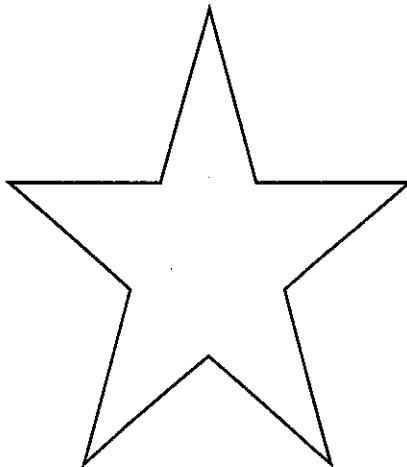
• Trigonometry SAS

$$\text{Area} = \frac{1}{2} bc \cdot \sin(A)$$

4. Channing Tatum just bought a weird-looking piece of land. Find the area of his land and build a modern contemporary house. The only restriction is that Channy boy hates right angles (because his mom gave him the right-angle hand gesture on her forehead each morning as he left for school, what a los*r).



5. Mr. Tatum also asks that you design a fish tank in the shape of star. He has provided a scale of the star and will pay you more money if you get closer to the exact area of the star using only straight lines; every line on the star is equivalent to 1 foot. Find the volume of the fish tank if it is 3 feet tall.



_____ = 1 foot