

# Solar Panel Project

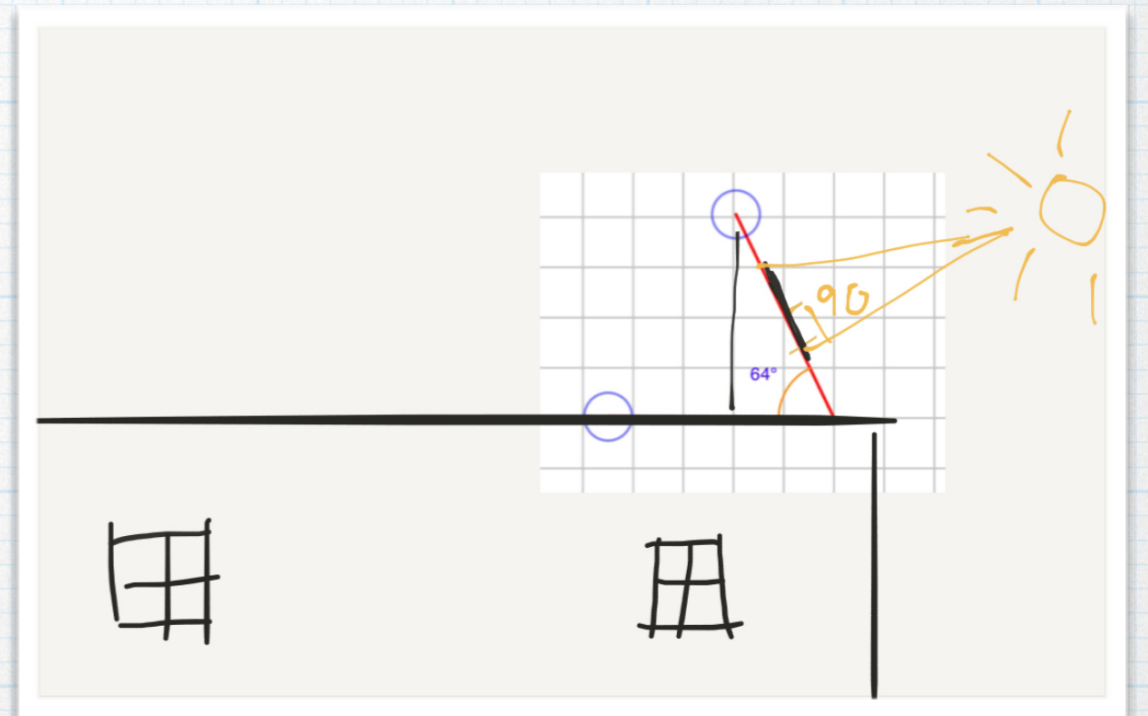
By Hannah Bontinen

# Finding the Angle

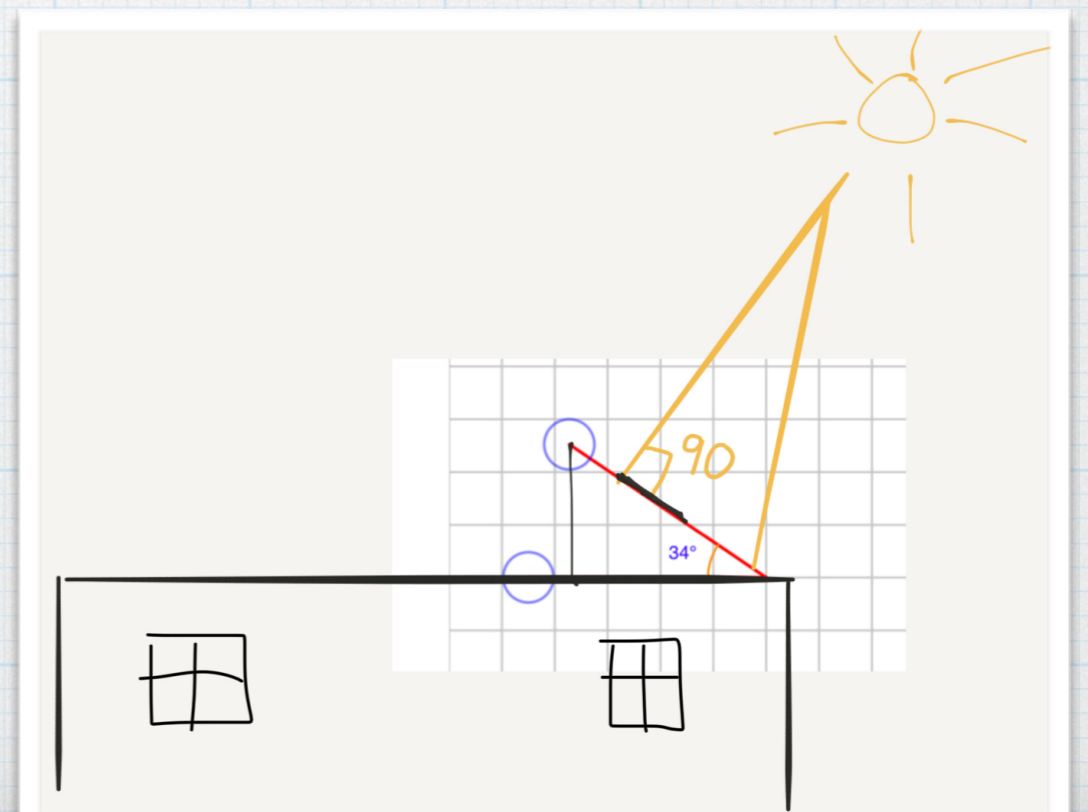
- \* The ideal angle for a solar panel depends on the sun and where you live. Because I live in the Northern Hemisphere, my solar panel faces south to get optimal light.
- \* You have to be conscious of having the sun on a 90 degree angle to your solar panel — this will give you the most electricity from your solar panel.
- \* In the summer the sun is higher up in the sky than in the winter. So in the summer and winter it is best to change the angle of your solar panel.

# My Angles

- \* For the winter I took the latitude of North Van  $49.2827 + 15 = 64^\circ$

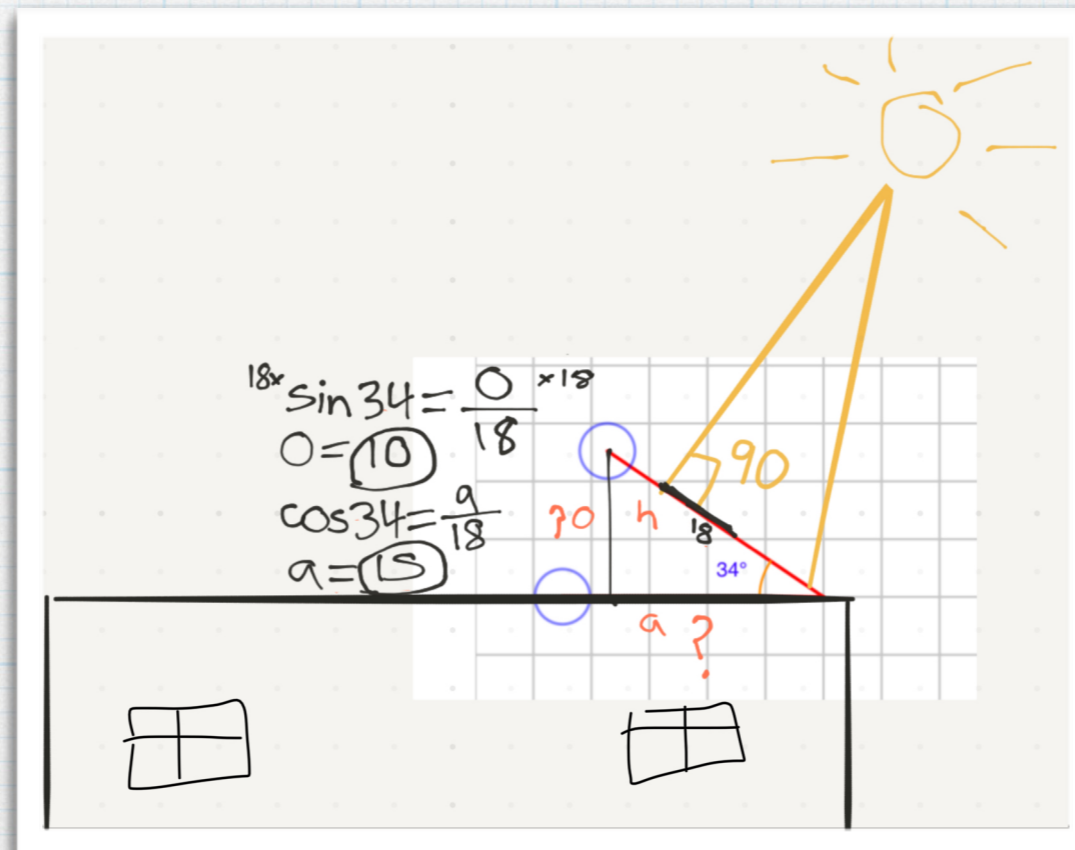


- \* And in the summer I took away 15 from the Latitude of 49.2827, which equaled to  $34^\circ$



# Using Trigonometry

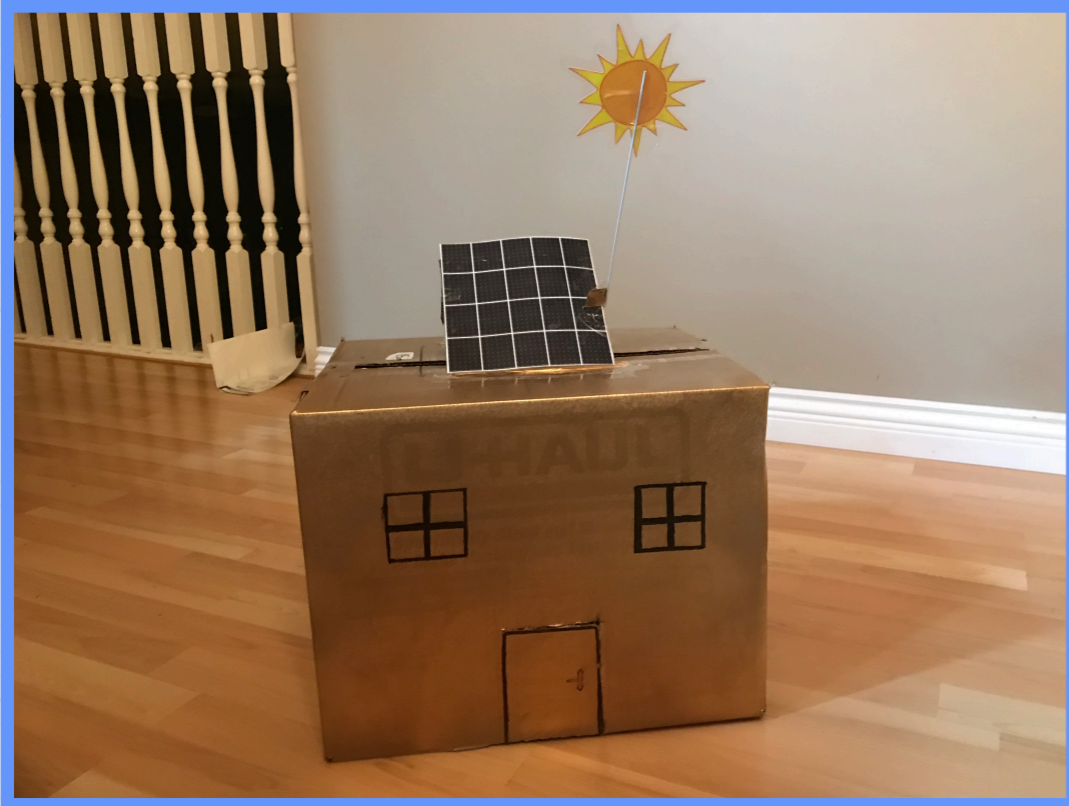
- \* To find the side lengths I decided on the hypotenuse 18cm and used the angle for summer  $34.3^\circ$ .



# Solar Panel

- \* The best type of solar panels for our use are Monocrystalline Silicon Solar Cells. They are better in low light, last longer, and are more efficient than polycrystalline solar panels.
- \* We needed 40 solar panels to generate enough electricity to pay for the energy we use to heat the house (using a high efficiency heat pump).
- \* The area of my solar panels is  $290\text{m}^2$  (or  $950\text{ft}^2$ ).
- \* These 40 panels are estimated to produce 10.6kW of power, or over \$1000 of savings per year.
- \* My solar panels is scalable for different size buildings. Larger buildings would require more power to heat a larger area. To generate more power for these buildings, I would need to add more solar panels. A building that used double the electricity for heating would need about double the number of solar panels.

# My Model



\* The model scale is 1cm = 1m

# Bibliography

- \* <http://www.solarpaneltilt.com>
- \* <https://solarpowerrocks.com/square-feet-solar-roof/>
- \* <http://www.wrecc.com/what-uses-watts-in-your-home/>
- \* <https://www.bchydro.com/news/conservation/2012/kilowatt-hour-explained.html>
- \* <http://energyinformative.org/best-solar-panel-monocrystalline-polycrystalline-thin-film/>