Bikini Bottom

**Names of all Group Members:**

Member 1: Fiona

Member 2: Kaitlyn

Member 3: Jasper

Member 4: Nief

Introduction:

 The Bikini Bottom is a town in the Nickelodeon show Spongebob Squarepants. This town holds an attraction of places to go to and is the place where Spongebob Squarepants resides. There are 4 quadrants where different places are located with different designers responsible for each section of the city. At the northwest is designer Jasper, at the northeast is designer Fiona, at the southwest is designer Kaitlyn, & lastly at the southeast is designer Nief. Explore the bikini bottom using the instructions & learn how to do geographical equations with us.
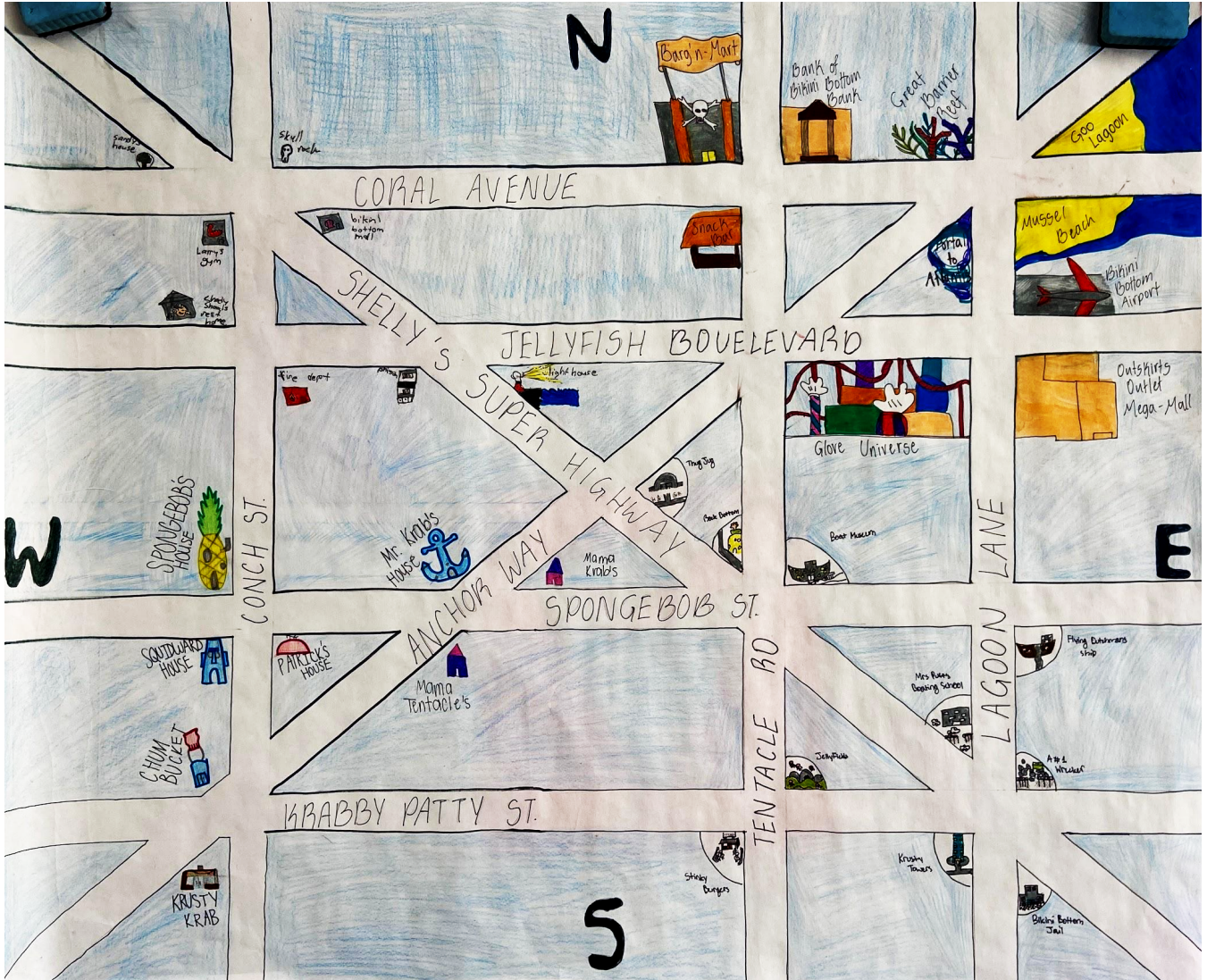
Designer: [Fiona]

The quadrant depicted below contains many tourist attractions and entertainment venues. The construction of this quadrant began with Glove World, which was later taken down and replaced with Glove Universe, Bikini Bottom's biggest amusement park. The beaches in this region, Goo Lagoon and Mussel Beach, have also evolved into great places to take a weekend trip. After visiting the beach, many choose to stop at the Bikini Bottom Outskirts Outlet Mega-Mall, filled with items you never knew you needed! The Bikini Bottom Airport is also located in this quadrant, along with the Portal to Atlantis, which is only open 3 times a year, and takes you to a world unlike any other. But be warned, the portal is not for the weak of stomach!

Map and Instructions of Quadrant:
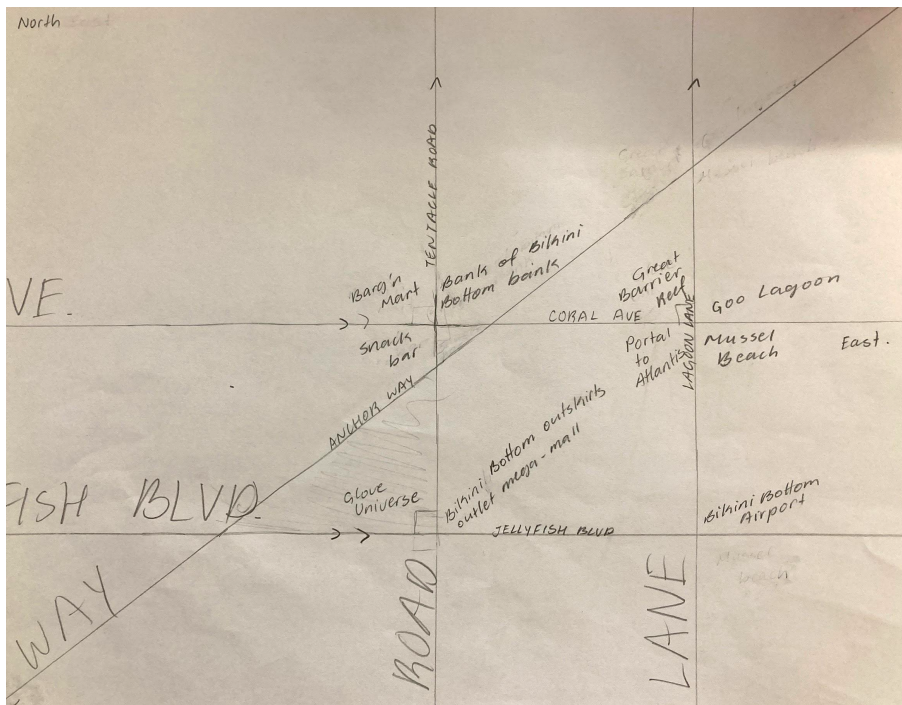
[List of Buildings in this Quadrant]
Barg'n-Mart (store)

Bank of bikini bottom bank
Bikini bottom outskirts outlet mega-mall
Mussel beach
Snack bar
Goo Lagoon
Glove universe
Bikini Bottom Airport
Great Barrier Reef
Portal to Atlantis

Two roads running west to east are **parallel** to each other. Coral Avenue is north of Jellyfish Boulevard.

Two roads running north to south are **parallel** to each other and **perpendicular** to both Coral Avenue and Jellyfish Boulevard. Tentacle Road is west of Lagoon Lane.

A 5th road, Anchor way, cuts diagonally upwards from west to east, running through Jellyfish Boulevard in the southwest corner. It cuts through Tentacle Road and Coral Avenue in the middle of the quadrant, forming a small **right triangle**. Last, it intersects Lagoon Lane at the northeast corner of the quadrant, creating **2 obtuse** and **2 acute angles.**

Glove Universe lies on the **right angle** of the triangle formed by Jellyfish Boulevard, Tentacle Road, and Anchor way.

Glove Universe is an **adjacent angle** to the Bikini Bottom Outskirts Outlet Mega-Mall, with the Mega-Mall to the east.

If Jellyfish Boulevard is the **transversal** that cuts through Tentacle Road and Lagoon Lane, then the Bikini Bottom Airport is a **corresponding angle** to the Bikini Bottom Outskirts Outlet Mega-Mall.

If Lagoon Lane is the **transversal** that runs through Coral Avenue and Jellyfish Boulevard, then the Bikini Bottom Airport is a **consecutive angle** to Mussel Beach with the Bikini Bottom Airport to the southeast.

Mussel Beach and Goo Lagoon form a **linear pair** with Goo Lagoon to the north.

Mussel Beach and the Great Barrier Reef form a set of **vertical angles** with the Great Barrier Reef to the northwest.

If Coral Avenue is the **transversal** that runs through Tentacle Road and Lagoon Lane, then Goo Lagoon and the Snack Bar form a pair of **alternate exterior angles** with the Snack Bar to the southwest.

The Snack Bar and the Barg'n Mart are a **linear pair** with the Barg'n Mart to the north.

The Snack Bar and the Bank of Bikini Bottom Bank are a set of **vertical angles** with the Bank of Bikini Bottom Bank to the northeast.

The Bank of Bikini Bottom Bank and the Portal to Atlantis are **alternate interior angles** with the Portal to Atlantis to the southeast.
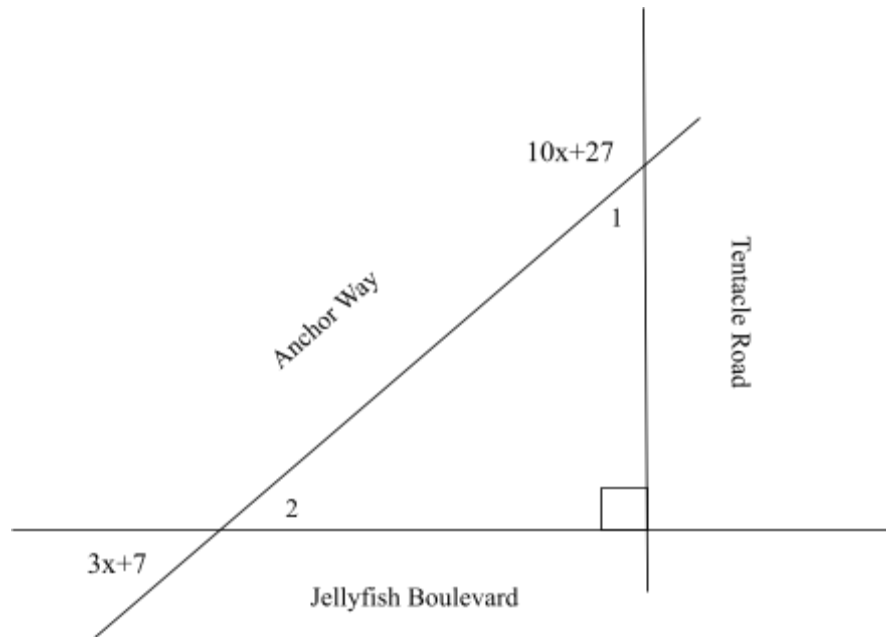
Triangle and Triangle Theorems:

In this quadrant, there is a right triangle formed by Anchor Way, Jellyfish Boulevard, and Tentacle Road. The sides of the triangle can be found using the pythagorean theorem and the angles measures found using triangle theorems.

[Pythagorean Theorem]
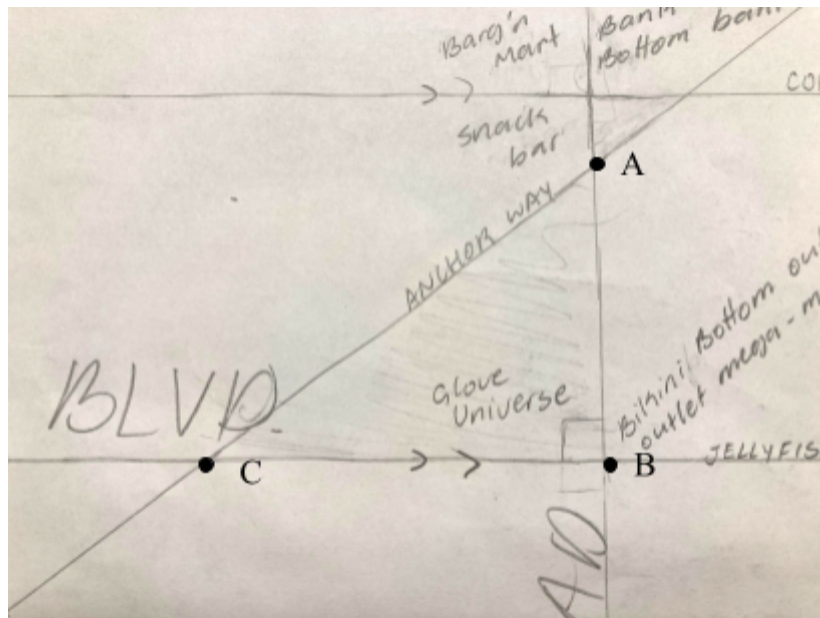
STATEMENTS	EXPLANATIONS
AB = 2in, BC = 2.6 in	Given
$a^2 + b^2 = c^2$	Pythagorean Theorem
$(AB)^2 + (BC)^2 = (CA)^2$	Substitution
$(2)^2 + (2.6)^2 = (CA)^2$	Substitution
$4 + 6.76 = (CA)^2$	Simplify
$10.76 = (CA)^2$	Combine Like Terms
$3.3 = CA$	Square Root

Solve for x and find the measures of Angle 1 and Angle 2.

| Solve for x:	Solve for the Measure of Angle 1:
$3x + 7 + 90 = 10x + 27$	$10(10) + 27 = 127$
$3x + 97 = 10x + 27$	$180 - 127 = 53$
$3x + 70 = 10x$	**Angle 1 = 53°**
$70 = 7x$	Solve for the Measure of Angle 2:
10 = x	$3(10) + 7 = 37$
	Angle 2 = 37°

The angles formed by Jellyfish Blvd. and Tentacle Rd. measure 90 degrees and 53 degrees (1). Angle 2, formed by Jellyfish Blvd. and Anchor Way measures 37 degrees. Jellyfish Blvd, Tentacle Rd, and Anchor Way form a right triangle.

(Next, you'll be taking a tour of Quadrant 3, Kaitlyn's Quadrant)

Designer: Kaitlyn

Quadrant 3 is the residential part of town. It contains everyone's houses, the dump, and a few restaurants. In this quadrant, you will find the famous Spongebob Squarepants and Patrick Star. The Krabby Patty is a landmark that is visited by the fish of Bikini Bottom daily.

Map and Instructions of Quadrant:
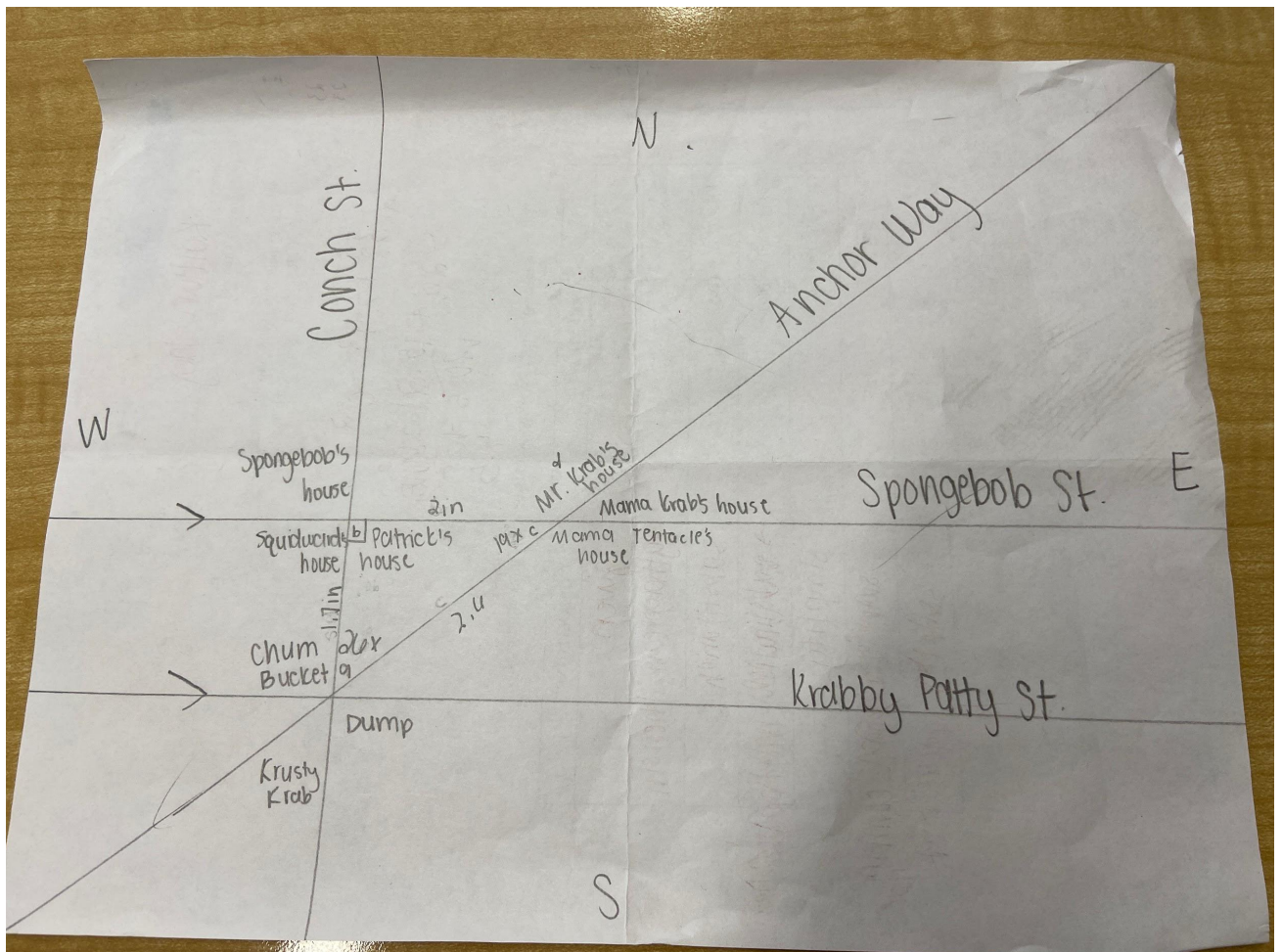
List of buildings in this quadrant:
1. Spongebob's house
2. Partrick's house
3. Squidward's house
4. Mama Tentacle's house
5. Mr. Krab's house
6. Mama Krab's house
7. Krusty Krab
8. Chum Bucket
9. Dump

Instructions:
1. Krabby Patty St. is the southernmost street in Bikini Bottom. It runs west to east.
2. Spongebob St. is north of and <u>parallel</u> to Krabby Patty St.
3. Conch St. is <u>perpendicular</u> with Spongebob St. towards the west side of the quadrant.y
4. Anchor Way is a diagonal line going from North east to south west. It intersects Spongebob Street and Krabby Patty Street. It intersects Krabby Patty st at the Conch St and Krabby Patty intersection.
5. Spongebob's house is located at the <u>northwest</u> side of the intersection of Conch St. and Spongebob St.
6. Patrick's house is <u>vertical angle</u> to Spongebob's house.
7. Just below Spongebob's house is Squidward's house. They are <u>linear pairs.</u>
8. If Conch St. is a <u>transversal</u> to Krabby Patty St. and Spongebob St., then Spongebob's house and the Dump are <u>alternate exterior</u> angles.
9. If Conch St. is a transversal to Spongebob St. and Krabby Patty St, the Chum Bucket is <u>corresponding</u> to Spongebob's house and <u>consecutive</u> to Squidward's house.

10. If Conch St. is a transversal to Spongebob St. and Krabby Patty St., Patrick's house is <u>alternate interior</u> to the Chum Bucket. Patrick's house helps form a <u>right triangle.</u>
11. At the Anchor Way and Spongebob St. intersection, the northern <u>obtuse angle</u> is Mr. Krab's House.
12. Mama Tentacle's House is <u>vertical</u> to Mr. Krab's House.
13. Mama Krab's house is <u>adjacent</u> to Mr. Krab's House and Mama Tentacles House

Triangle and Triangle Theorems:

This section contains equations for the triangle formed by Spongebob St., Conch St., and Anchor Way. Here you will find the length of each side of the triangle in inches and the measure of the angles in degrees.
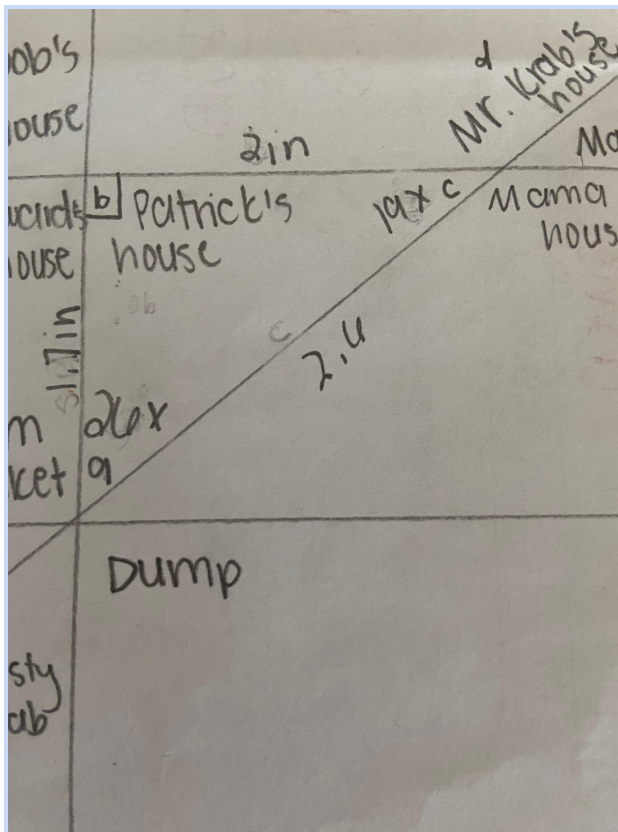
AB=1.7, BC=2	Given
$a^2+b^2=c^2$	Pythagorean Theorem
$AB^2+BC^2=CA^2$	Substitution
$1.7^2+2^2=CA^2$	Substitution
$2.89+4=CA^2$	Simplify
$6.89=CA^2$	Combine Like Terms
$2.6\approx CA$	Square Root

Triangle Angle Sum Theorem

Solve for x
$\angle A = 26x, \angle B = 90°, \angle C = 19x$
$\angle A + \angle B + \angle C = 180$
$26x + 90 + 19x = 180$
$45x + 90 = 180$
$45x = 90$
x=2

$\angle A = 26 (2) \qquad \angle C = 19 (2)$
$\angle A = 52°, \angle B = 90°, \angle B = 38°$

|	
$\angle A = 26x, \angle B = 90°, \angle C = 19x$	Given
$\angle A + \angle B + \angle C = 180$	Triangle Angle Sum Theorem
$26x + 90 + 19x = 180$	Substitution

45x + 90 = 180	Combine Like Terms
45x = 90	Subtraction Property of Equality
x=2	Division Property of Equality

Next, you'll be taking a tour of Quadrant 2, Jasper's Quadrant.

Designer: Jasper
Quadrant 2 is the most general area in the town, it has a variety of locations ranging from a rest home to a fire department. Even though it is general it still has some of the most important places in town, like the hospital and fire dept.

Map and Instructions of Quadrant:
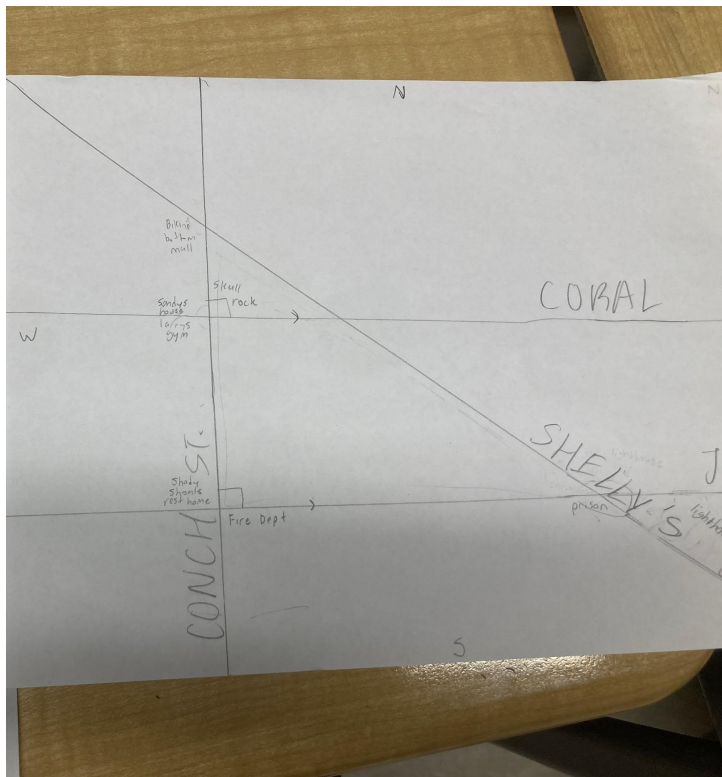
List of buildings in this quadrant
1. Bikini Bottom Hospital
2. Fire Dept
3. Shady Shoals Rest Home
4. Sandys House
5. Larry's Gym
6. Skull Rock
7. Bikini Bottom Mall
8. Bikini Bottom Prison
9. Lighthouse

Instructions:
1. Conch St is going between North and West and is going south
2. Coral Ave is about right in the middle of the quarter going West to East
3. JellyFish Blvd is going West to East at the bottom half in between West and South
4. Shelly's Super Highway is intersecting all three other roads, going from the North West corner to the South East corner
5. The fire dept can be found on the south East corner of Conch St and JellyFish ave
6. Sandys house is the exterior alternate angle of the fire dept
7. Shady shoals rest home is corresponding angles with Sandy's house
8. Shady shoals rest home is a consecutive angle to Larrys gym
9. Larry's gym is vertical to skull rock as well
10. Skull rock and bikini bottom mall are a linear pair

11. Make sure that bikini bottom mall and shady shoals rest homeware both alternate interior angles
12. The town prison is at the southwest angle, at the intersection of shellys super highway and jellyfish blvd
13. And the lighthouse is adjacent to the prison

Triangle and Triangle Theorems:
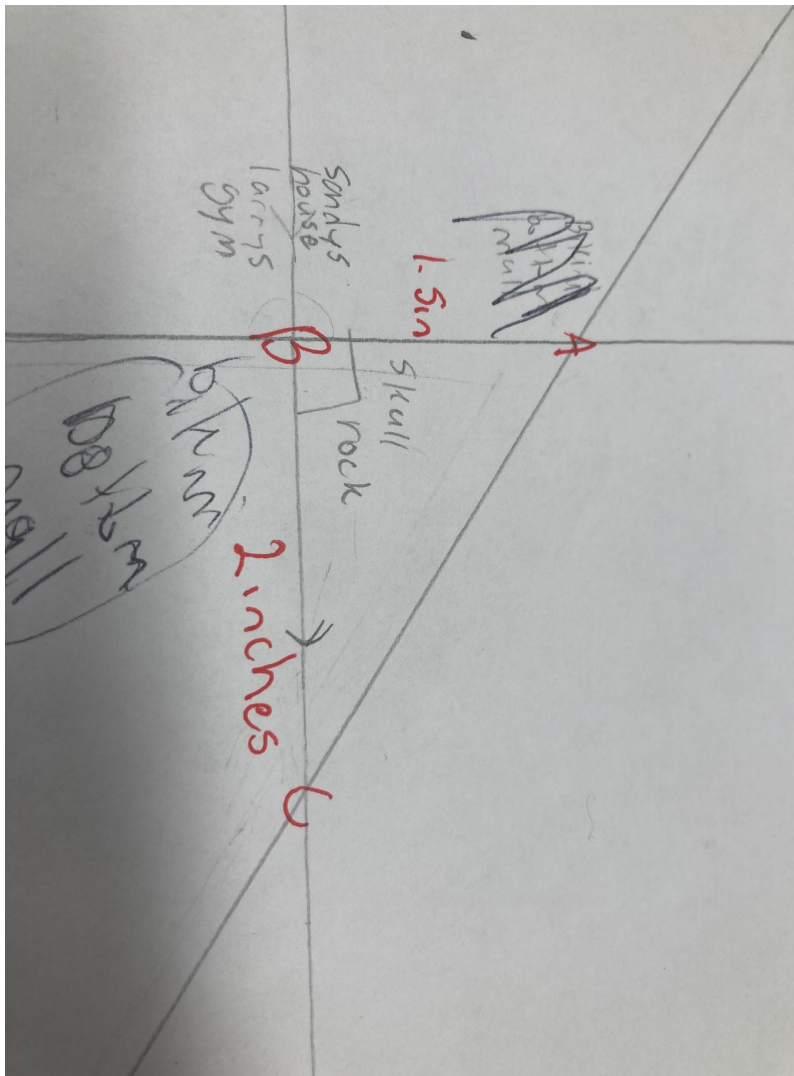
This section will show equations for a triangle that has been formed by conch st, coral ave, and shellys super highway. This will show the measurements of the triangle, including length of the sides and the different angles degrees.

$\angle A = 60x, \ \angle B = 90°, \angle C = 30x$

$\angle A + \angle B + \angle C = 180$

$60x + 90 + 30x = 180$

$45x + 90 = 180$

$45x = 90$

$x = 2$

Show all work including relevant diagrams and calculations. Make sure to discuss your process and your answer in the context of your town map.

[Insert work for Triangle Angle Sum/Exterior Angle Problem]
Show all work including relevant diagrams and calculations. Make sure to discuss your process and your answer in the context of your town map.

(Insert transition statement here)

Designer: Nief

 This part of the Bikini Bottom is a spot where most of the fun & educational places are held. You can easily reach this part of the city using the highway, the lagoon, tentacle, spongebob, & krabby patty street. Navigation is very simple in Bikini Bottom, but enough talk about that. Here in the southeast of Bikini Bottom are the JellyFields, Goofy Goobers Ice Cream Party Boat, The Krusty Towers, & Mrs Puff's famous Boating School where you can earn your drivers license.

Map and Instructions of Quadrant:
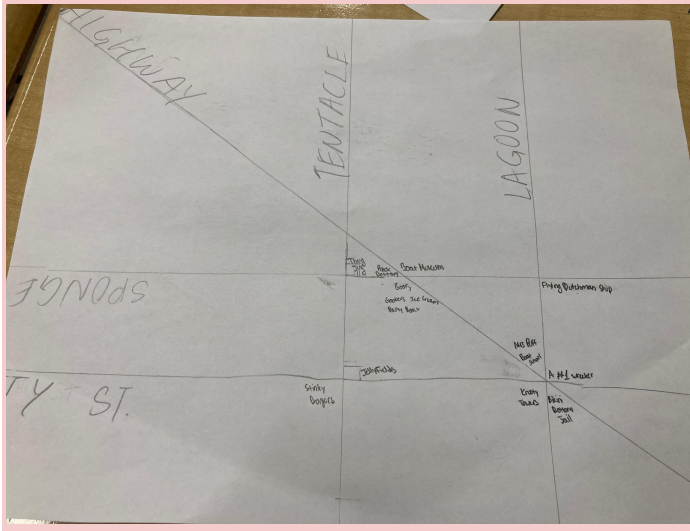
Building's Inhabited

1. **Mrs. PuffsBoating School**
2. **JellyFields**
3. **Bikini Bottom Jail**
4. **Flying Dutchman's Ship**
5. **Krusty Towers**
6. **Goofy Goober's Ice Cream Party Boat**
7. **Thug Jug**
8. **Boat Museum**
9. **A #1 wrecker**
10. **Rock Bottom**
11. **Stinky Burgers**

Quadrant Instructions

1. The starting street Krabby Patty St. is at the bottom of south west & parallel to it is Spongebob st.

2. A transversal is created when Shellys Highway crosses Krabby Patty st. & Spongebob st.

3. An obtuse angle is created by a intersecting line of shelly highway at the top left named Tentacle Road

4. To the right of Tentacle Road another street is created. It is <u>parallel</u> to tentacle road & is labeled Lagoon lane.

5. At the <u>Southwest</u> corner of Krabby Patty st, a <u>right angl</u>e is formed. This is where Stinky Burgers reside.

6. Stinky Burgers creates a<u> vertical angle</u> with another zone called JellyFields.

7. Above Jelly Fields is a <u>corresponding angle</u> called the Thug Jug

8. Inside this <u>right triangle</u> to the left of it is Rock Bottom

9. Right next to Rock Bottom is the <u>intersection</u> between Shellys Highway & Spongebob st. This <u>intersection</u> creates a<u> linear pair</u> which is labeled Boat Museum

10. At the intersection of these two roads below it is the Goofy Goobers Ice Cream Party Boat.

11. An<u> alternate interior</u> angle is created by Goofy Goobers Ice Cream Party Boat when Shelly Highway & Lagoon Lane crosses. This is labeled Mrs Puff's Boating school.

12. A <u>perpendicular line</u> is then created by Lagoon Lane & Spongebob st. & at the top right of this<u> intersection</u> is where the Flying Dutchman's ship lies.

13. Below the Flying Dutchman's Ship a <u>consecutive angle</u> is formed & that angle is where the #1 Wreckers is.

14. At the Far <u>Southeast</u> corner an <u>adjacent angle</u> is formed on the left side & is where criminals head to. The Bikini Bottom Jail.

15. Lastly, back to the Flying Dutchman's Ship an <u>intersection </u>is also created between the lagoon lane & krabby patty st. There an <u>Alternate exterior angle</u> is formed and there lies Krusty Towers.

Triangle and Triangle Theorems:

For this section of the presentation, I will be showing you how to use the pythagorean triangle theorem using a right triangle from my section of the map.
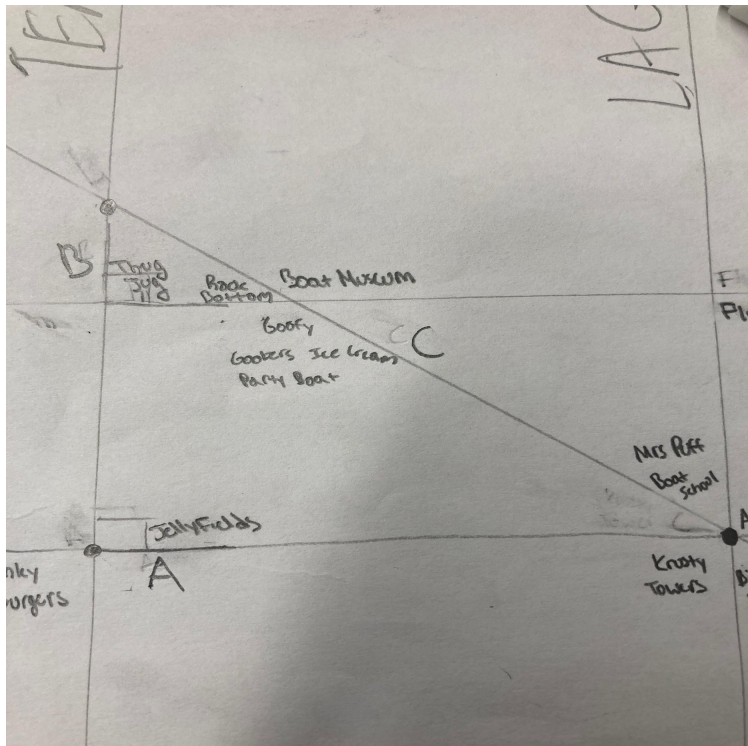
| A= 7.5 B= 6 C= ?	Given
$6^2 + 7.5^2 = c^2$	Substitution Property
$56.25 + 36 = c^2$	Square Root Property
$92.25 = c^2$	Addition Property

9.6 = c^2	Simplification Property

How To Calculate The Triangle:

 First you must start by measuring all of your angles with a ruler. It is recommended that you use cm because when the numbers are bigger, they are easier to calculate & are more accurate. Once you find your 'Given' (The numbers that you are given besides the longest angle) you can start making your equations. You start by now putting your angles into angles equations.

The next step you want to do is substitute them by turning them into numbers to calculate it more accurately. Before you even start with the addition property, you must first square root both A & B angles which will be the (Square Root Property). After you have done this you can now continue with the addition property & add both sides together. Once given angle C it is not over yet. To finalize everything you must simplify it to its simplest form so you can label the angle.
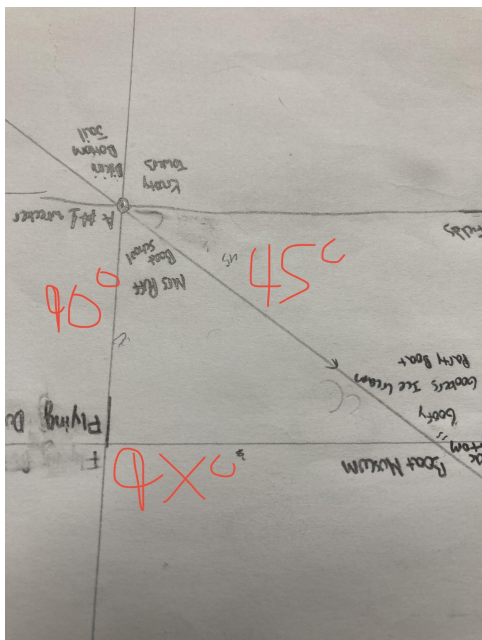
To showcase more about the triangle theorem, I decided to make missing values & work with you guys to find the missing angle.

Sn*: My map shapes SUCK. why is there only right triangles 🥵

Triangle Theorem:

 To start off, you must make an equation to piece everything together. We must take everything that we are given and turn it into an equation.
90 + 45 + 9x = 180
After your equation is made, now you just need to break everything down. You want to take your biggest number 90 & subtract it from 180 & do the same for 45 until you're left with 9x=??* (OR you can start by adding liked terms; (90+45) then continue with subtraction.
9x= 45

This part is easy, all that's left is to divide both numbers & the solution of both of these numbers will be equal to x so; x = 5

If you want to take it to the next step & check if your equation is correct,(Shouldn't have to do this for a right triangle tbh 😔) you can take your x and substitute it with 5 then multiply 5 & 9 to get 45 & finally add everything normally to see if you get 180.

 Now that each designer has presented, I will now bring you to the finale of this project..

Conclusion:

Our group learned many things while completing this benchmark. We improved our skills for Pythagorean Theorem, creating our own problems specific to our quadrants. We also learned more about Triangle Theorems that we used to create original problems for our quadrants. The mix of creativity and mathematics in our benchmarks help improve our understanding of these concepts in a fun way.

We collaborated well, completing each of our own quadrants and splitting up the group work evenly amongst our group members. When we realized that our final map had differences to our draft, we worked together, communicating with each other and with Ms.Gasser to come up with a solution. Together, we created a map that had 4 quadrants that fit together to create our town, while still preserving the creative elements from all 4 group members. In the end, we excelled on one of the SLA core values, collaboration, and created a map and visitor's guide that is not only visually appealing, but informative and creative.