Geometry PBA Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

January 2015

You are going to use your PBA project this January to explore the geometry

and trigonometry of pool. Maybe someday one of you will be on ESPN in the

World Pool Championships and you'll remember your old math class. Dare to

dream.

The project has several parts:

1. In Part 1, you will respond to a prompt with a design provided for you.

"You can't hustle a hustler."

*- E. L. Woo*

2. In Parts 2-4 , you will use your creativity and make designs of your own

according to certain specifications.

In order to earn full credit on this project, you must clearly show your work for each step. A sample for how to show your work is provided at the end of this packet. Your work needs to look like that for you to earn full credit. *Carefully inspect this work sample before you begin any work on your own.*

This is an independent project. You may ask me *clarifying* questions about it but you shouldn't expect any help with the actual math. It's all things you know at this point.

This is an independent project. You are not to work with each other. The last step in this project is to sign an *Independence Statement* that certifies that you did not provide or receive any outside help from classmates, friends, tutors, parents, pets, aliens, or Jedi visions. Okay, Jedi visions are acceptable.

*PBA Calendar:*

* There will be a few check-ins along the way. These are intended to help keep you on track.
* Check-in #1 is on Monday, January 12th. On this day, you need to show that you have completed up to *at least* Part I. Accuracy will not be checked; however, you need to show that you've done it.
* Check-in #2 is on Thursday, January 15th. On this day, you need to show that you have completed up to *at least* Part II. Accuracy will not be checked; however, you need to show that you've done it.
* Check-in #3 is on Tuesday, January 20th. On this day, you need to show that you have completed up to *at least* Part III. Accuracy will not be checked; however, you need to show that you've done it.
* If you are absent on a check-in day, you must email me and follow the instructions I give to validate your check-in.

If you miss a check-in, you will have 5% deducted from your final score. That means if you earn 80%, your score will be 75%.

**The final project is due on Friday, January 23th (8th period).** Turning in the project means submitting this packet with completed diagrams, work shown, and a signed Independence Statement. If you need to attach additional work pages, staple them.

You are certainly welcome to turn in the project early.

If you attempt to turn the project in on Monday, January 26th, you will only earn half-credit for what you actually did. That doesn't mean you get an automatic 50%. That means that if your work earned an 80%, you will score a 40%. Let's not get into that situation.

 108 in. *Part I - Shot #1*

8

 54 in.

In this shot, your goal is to make the 8-ball into the middle pocket on the top of the table (darkened). This pocket is directly in the middle of the table.

* The 8-ball is 8 inches from the top of the table and 48 inches from the right-hand wall of the table.
* The cue ball must start somewhere along the line directly between the two middle pockets.
* There is no minimum or limit to the number of bounces you can use.

*Objective:*

a) Diagram the shot using a ruler and protractor. Label the diagram appropriately.

b) State how far from the bottom wall the cue ball will be to make this shot possible.

 108 in. *Part II - Shot #2*

 54 in.

*Objective:*

Design a shot that will sink the 8-ball in a pocket. Your shot must make the cue ball bounce off at least **two** different walls before it hits the 8-ball.

* First, you should choose a pocket and determine where you want the 8-ball.
* Then plan/sketch your bounces.
* Then determine where the cue ball started.
* Your finished diagram should have the location of the 8-ball, the location of the cue ball (both labeled, see the work sample) and the path that the shots take. Use a ruler. Label all angles and distances along the walls. Your examples from class should help (label EVERYTHING you can). Use a protractor and ruler.
* *You cannot use any of the same angles / distances we used in class.*

 108 in. *Part III - Shot #3*

 54 in.

*Objective:*

Design a shot that will sink the 8-ball in a pocket. Your shot must make the cue ball bounce at least three times before it hits the 8-ball. It doesn't have to be three different walls, but it needs three bounces and then to hit the 8 in a pocket.

* First, you should choose a pocket and determine where you want the 8-ball.
* Then determine your bounces.
* Then determine where the cue ball started.
* Your finished diagram should have the location of the 8-ball, the location of the cue ball (both labeled, see the work sample) and the path that the shots take. Use a ruler. Label all angles and distances along the walls. Your examples from class should help. Use a protractor and ruler.
* *You cannot use any of the same angles / distances we used in class.*

 108 in. *Part IV - Shot #4*

 54 in.

*Objective:*

Design a shot that will sink the 8-ball in a pocket. Your shot must make the cue ball bounce at least twice *and* the 8-ball itself has to bounce off one wall. This means the cue ball bounces off two walls, then it hits the 8, then the 8 bounces off a wall, then it goes in.

Hint: Plan it first, then give the 8 ball a location (away from which 2 walls).

Use the same guidance from shots #2 and #3 for this Part.

*Work Sample*

Your work for this project needs to be neat. Use the sample below as a guide to how your work must look.

 θ: $tanθ=\frac{7}{5}$

5 in.

 $θ=tan^{-1}\left(\frac{7}{5}\right)$

θ

7 in.

 $θ=54.5°$

 54 in.

**Grading Rubric**

*Mathematical Accuracy - Rounding*

For the middle steps of these problems, round your angles to the nearest tenth and your lengths to the nearest hundredth. Round your final answers the same way. Your angles will be measured. Use a protractor and do it accurately.

*Effort & Neatness*

This is supposed to represent your best work. Treat it accordingly. Use a folder or binder. Any work turned in that is crumpled, ripped, wrinkled, etc. will have a point deduction (per rip, wrinkled, crumpled).

All work must be done in pencil.

There are practice pages with pool tables on the class website. There is also a copy of this document on the website. Make sure your final product is neat and clear. If it's hard to read, it's not going to be get read.

*Independence Statement*

"I certify that I completed this project by myself. I did not receive any help from a parent, friend, tutor, or other outside source. I also did not provide help to anybody else."

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 Name Signature