Note: You are free to use (e.g. copy verbatim) any text in black. All text in red indicates areas where you need to insert your own work.

Experiment #4: Casino Equilibria

Introduction:

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Instructions:

You played a dice-based gambling game where the goal is to establish equilibrium on a force table. You have to balance two hangers against the house hanger. To play the game, you rolled three dice:

1. The first die set the mass **added** to the House hanger: (50 g) * (# of pips)
2. The second die set the angle of hanger #1: (25°) * (# of pips)
3. The third die set the mass **added** to hanger #1: (50 g) * (# of pips)

The angle of the House hanger is always located at 0°. Your goal is to find the location and mass of hanger #2 to establish equilibrium. You need to solve by using both graphical and analytical methods.

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Setup:

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Instructions:

Show how the problem can be solved graphically. Define all relevant terms.

Provide a derivation of the mathematical solution, starting from Newton's 2nd law.

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Data and analysis:

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Instructions:

Compare the graphical and mathematical solutions. Do this for two cases that you studied in lab. If you get a negative number for the angle, be sure that you know how to interpret that.

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Conclusion:

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Instructions:

Write a concluding statement where you comment on the comparison of the methods. You might try to address which method you believe to be better.

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