IMP Honor Information and Application

General Information

• The Interactive Mathematics Program (IMP) is an exciting way for high school students to learn mathematics. Brookline's three year IMP program replaces the traditional Algebra II/Trigonometry/Precalculus/Calculus sequence. The IMP curriculum is problem-based. Each year consists of four or five units that are each organized around a central problem or theme. Motivated by this central focus, students solve a variety of smaller problems, both routine and non-routine, that develop the underlying skills and concepts needed to solve the central problem in that unit.

• The IMP curriculum challenges students to actively explore open-ended situations in a way that closely resembles the inquiry method used by mathematicians and scientists in their work. IMP calls on students to experiment with examples, look for and articulate patterns, and make, test, and prove conjectures.

• IMP integrates algebra, geometry, and trigonometry with topics such as probability, statistics, discrete mathematics, matrix algebra, coding, circle trig and calculus.

• IMP is very student-centered. The students, working together, develop their own understanding of the concepts being discussed. Instead of providing a lot of direct instruction, the teacher serves as a "coach" who organizes the investigations the students undertake and then creates opportunities for the students to synthesize their learning.

• At Brookline High School IMP is taught at the Honors level. Students who complete either Geometry Honors or Geometry Advanced in grade 9 are excellent candidates to enroll in IMP. In addition, students who are very successful in Geometry could access the curriculum of the course as well. Students in this situation should speak with their teacher to get a sense if IMP would be a good fit for them.

• IMP Students are evaluated according to a variety of criteria. Class participation, daily homework assignments, Problems of the Week, portfolios, and unit assessments.

• Problems of the Week" (POWs) are open-ended investigations in which students write and illustrate their strategies and solutions to complex problems.

• Students who complete IMP are prepared to take introductory Calculus and Statistics courses at the college level. National data shows that IMP students score well on standardized tests such as the SAT and ACT, and enroll in highly regarded colleges and universities throughout the country. In addition, a significant number of IMP students go on to complete engineering programs in college.

IMP 2 Honor Application

Basic Information

Name: _____ Date: _____

9th grade course:

- ❏ Geometry
- ❏ Geometry Honors
- ❏ Geometry Advanced

9th grade teacher: _____

Detailed Information

1. Write a short essay describing the reasons you wish to enter the IMP program. In your essay, make sure to include an explanation as to why you think IMP fits the way that you best learn mathematics. Please word process your essay and attach it to this document.

2. IMP students, working independently and collaboratively, explore complex math problems. To see if IMP would be a good fit for the way you think about mathematics investigate the math problem shown on the back of this page. You do not necessarily need to "solve" the problem. Rather, we are looking at the way you approach math problems that you haven't seen before. Do your work on a separate piece of paper and attach it to this document. Be sure to explain your thinking, not just your solution.

Please sign this application in the space below and have your parent or guardian sign as well

_____ _____

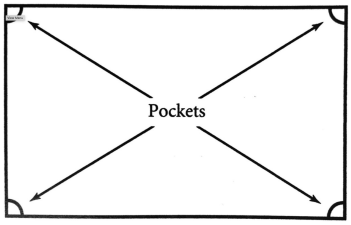
Student Signature Guardian Signature

Turn in your completed application to your teacher or to Mr. Paris in the math office (Rm. 268).

Due: March 1, 2020

IMP PROBLEM:

Imagine a modified pool table in which the only pockets are those in the four corners. The diagram shows such a table as viewed from above.



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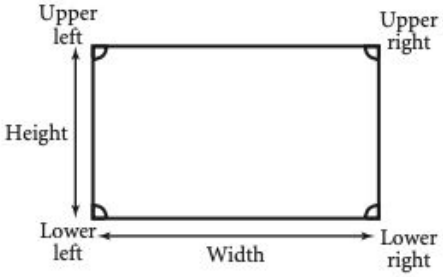
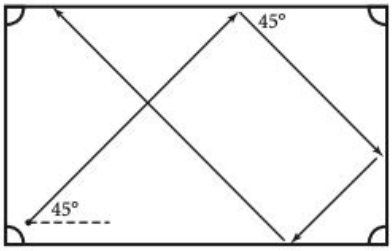
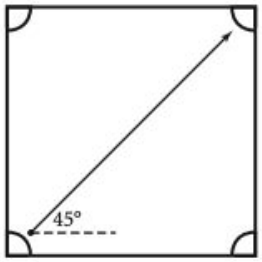


Imagine that a ball is hit from the lower-left corner in a diagonal direction that forms a 45° angle with the sides. Imagine that every time the ball hits an edge of the table, it bounces off, again at a 45° angle, and that it continues this way until it hits one of the corner pockets perfectly. For example, using the previous diagram, the first few bounces of the ball would look like this.



Of course, the path of the ball will depend on the table's shape. For example, with a square table, the ball would go directly into the opposite corner without bouncing at all.



Make the following assumptions:

- Both the length and the width of the table are whole-number distances.
- The ball is always shot at an angle of 45°.
- The ball is always shot from the lower-left corner.

Your task is to investigate what happens to the ball and how this <u>depends on the dimensions</u> of the table. Answer each of the questions below:

- Does the ball always hit a pocket eventually?
- If so, which pocket does it hit?
- If it does hit a pocket, how many times does it bounce before it hits the pocket?

IMP 3 Honor Application

Basic Information

Name: _____ Date: _____

10th grade course:

- ❏ Algebra 2
- ❏ Algebra 2 Honors
- ❏ Algebra 2 Advanced

10th grade teacher: _____

Detailed Information

3. Write a short essay describing the reasons you wish to enter the IMP program. In your essay, make sure to include an explanation as to why you think IMP fits the way that you best learn mathematics. Please word process your essay and attach it to this document.

4. IMP students, working independently and collaboratively, explore complex math problems. To see if IMP would be a good fit for the way you think about mathematics investigate the math problem shown on the back of this page. You do not necessarily need to "solve" the problem. Rather, we are looking at the way you approach math problems that you haven't seen before. Do your work on a separate piece of paper and attach it to this document. Be sure to explain your thinking, not just your solution.

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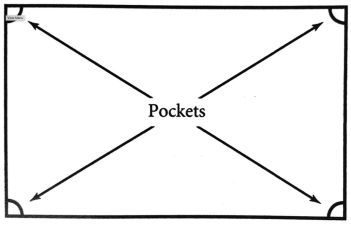

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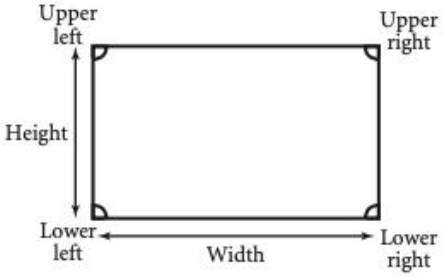

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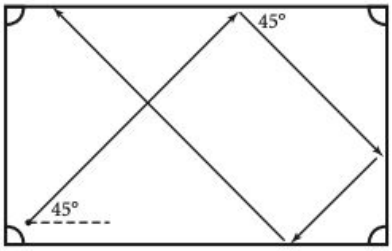

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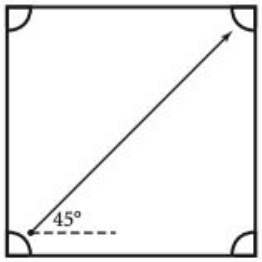

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