



## Problem of the Week

### Problem B

#### Dicey Products

Jordyn and Langdon have two dice, one purple and one green. When they roll the dice, they know there are a total of  $6 \times 6 = 36$  possible outcomes for the top two numbers on the dice.

	<b>Purple</b>	<b>Green</b>																														
(a) In the diagram, join any dot on the left with one on the right such that the product of those two numbers is odd. How many ways are there to obtain an odd product?	<table border="0" style="width: 100%;"><tr><td style="text-align: right; width: 50%;">1</td><td style="text-align: center;">●</td><td style="text-align: center;">● 1</td></tr><tr><td style="text-align: right;">2</td><td style="text-align: center;">●</td><td style="text-align: center;">● 2</td></tr><tr><td style="text-align: right;">3</td><td style="text-align: center;">●</td><td style="text-align: center;">● 3</td></tr><tr><td style="text-align: right;">4</td><td style="text-align: center;">●</td><td style="text-align: center;">● 4</td></tr><tr><td style="text-align: right;">5</td><td style="text-align: center;">●</td><td style="text-align: center;">● 5</td></tr><tr><td style="text-align: right;">6</td><td style="text-align: center;">●</td><td style="text-align: center;">● 6</td></tr></table>	1	●	● 1	2	●	● 2	3	●	● 3	4	●	● 4	5	●	● 5	6	●	● 6	<table border="0" style="width: 100%;"><tr><td style="text-align: right; width: 50%;">● 1</td><td style="text-align: center;">● 1</td></tr><tr><td style="text-align: right;">● 2</td><td style="text-align: center;">● 2</td></tr><tr><td style="text-align: right;">● 3</td><td style="text-align: center;">● 3</td></tr><tr><td style="text-align: right;">● 4</td><td style="text-align: center;">● 4</td></tr><tr><td style="text-align: right;">● 5</td><td style="text-align: center;">● 5</td></tr><tr><td style="text-align: right;">● 6</td><td style="text-align: center;">● 6</td></tr></table>	● 1	● 1	● 2	● 2	● 3	● 3	● 4	● 4	● 5	● 5	● 6	● 6
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(b) What does your result in part (a) tell you about how many ways there are to obtain an even product?																																
(c) Is the product 4 or 6 more likely to occur? Why?																																
(d) In the table, enter the possible odd products in the first column, the number of ways that product could occur in the middle column, and the theoretical probability of that outcome in the third column. (This has been done for odd product 1.)																																

<b>Odd Product</b>	<b>Number of Ways</b>	<b>Theoretical Probability</b>
1	1	$\frac{1}{36}$

(e) Roll two dice 36 times and record the product of the top two numbers for each roll. Count the number of each odd product that occurred, and then calculate the experimental probability of rolling that number. Compare the experimental probability to the theoretical probability calculated in part (d).