Problem of the Week

Problem C

The Sun Wheel Game

In “The Sun Wheel Game”, two players, Arvil and Bob, alternate turns placing discs numbered 1 to 9 in the circles on the board. Arvil goes first. Each number can only be used once. The object of the game is to be the first to place a disc so that the sum of the 3 numbers along a line through the centre circle is 15.

On the first move, Arvil placed a 6 in the centre circle. This is shown on the diagram to the right.

Bob then placed a 3 in one of the outside circles on his first turn. This is shown on the diagram to the right.

Arvil places some number in the space marked with a question mark on his second turn. The diagram to the right shows the board after Arvil’s first two moves and Bob’s first move.

What are the possible moves that Arvil could make on his second turn so that no matter what Bob follows with on his second turn, Arvil can win on his third turn? Justify your answer.