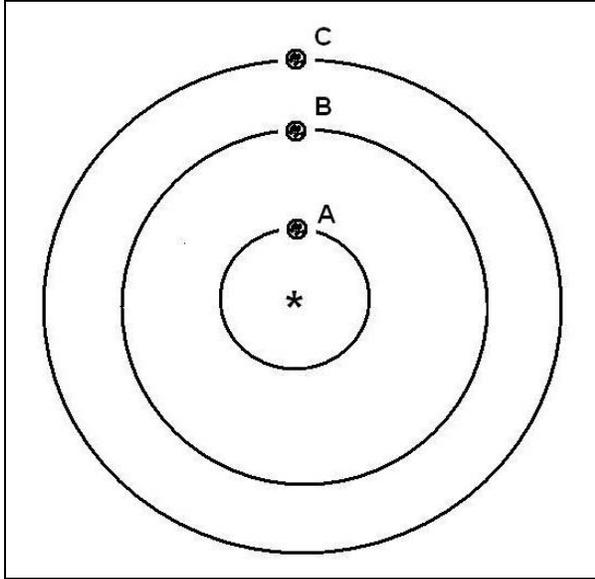


# Planetary Conjunctions



Since 1995, astronomers have detected over 350 planets orbiting distant stars. Our solar system has 8 planets, and for thousands of years astronomers have studied their motions. The most interesting events happen when planets are seen close together in the sky. These are called conjunctions, or less-accurately, alignments. The figure shows a simple 3-planet solar system with the planets starting out 'lined up' with their star. Each planet revolves around the star at a different pace, so it is a challenge to predict when they will all line up again.

**Problem 1** - An astronomer detects three planets, A, B, C, that orbit their star once every 1, 2 and 4 years in a clockwise direction. Using the diagram above, draw a series of new diagrams that show where will the planets be in their orbits after: A) 1 year? B) 2 years? C) 3 years? D) 4 years?

**Problem 2** - Suppose the three planets, A, B and C, orbited their star once every 2 years, 3 years and 12 years. A) How long would it take for all three planets to line up again? B) Where would the planets be after 6 years?

Problem 1 - Students will draw dots located as follows in the top diagram series:

Problem 2 - The bottom series of 12 possibilities indicates it will take 12 years to return to the original line-up. The pattern after 6 years is also shown.

