



The Asteroid 2005 YU55 passed inside the orbit of our moon sometime between November 8 and November 9, 2011. The diagram shows the lunar orbit as a circle centered on Earth. The diagonal line is the orbit of Earth around the sun. The line segment AB is a portion of the orbit of the asteroid. The horizontal line at the bottom of the page is 1 million kilometers long at the scale of the figure. Point A is the location of the asteroid on November 8.438. Point B is its location one day later on November 9.438, where we have used digital days to indicate a precise hour and minute within each endpoint date in terms of Universal Time.

Problem 1 - The figure above shows the location of the Moon on November 9 at 10:13 Universal Time (9.438 days) in its counter-clockwise journey around earth in a circular orbit. The period of the orbit is 27.3 days. What was the date and time when the asteroid was at Point A?

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Answer: The time between Point A and Point B is exactly 1.0 days, so we need to determine the position of the moon 1 day earlier that its location in the diagram.

The moon travels 360 degrees in 27.3 days for a speed of 13.2 degrees per day, so we need to find the position of the moon 13.2 degrees clockwise of its position in the diagram. Using a protractor, the figure below shows this position.

