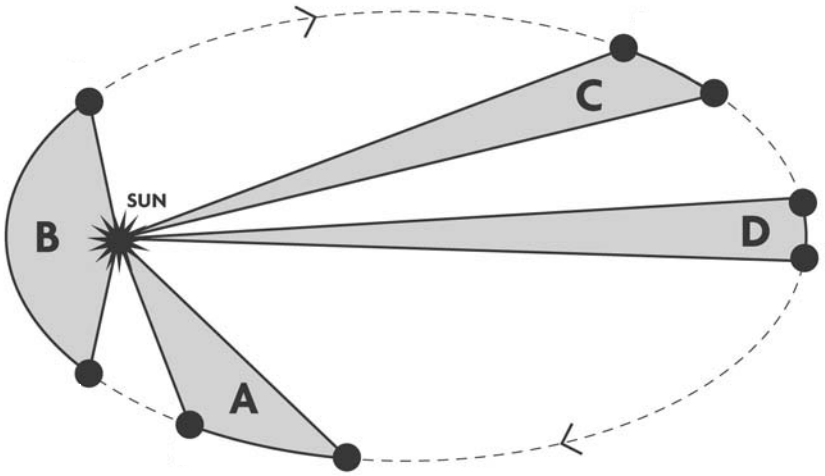
Astronomy Ranking Task:
Kepler's Laws – Orbital Motion

Exercise #1

Description: The figure below shows a comet traveling in an elliptical orbit around the Sun. The comet is shown as it moves through four different segments of its orbit (labeled A, B, C, and D). During each segment of the orbit the comet sweeps out the triangular shaped area shaded in gray. Assume each of the shaded triangular shaped areas has the same size.



A. Ranking Instruction: Rank the time it took (from greatest to least) for the comet to move along each of the segments (A – D) of the orbit.

Ranking Order: Greatest 1 _____ 2 _____ 3 _____ 4 _____ Least

Or, the time to travel each segment would be the same. _____ (indicate with check mark).

Carefully explain your reasoning for ranking this way:

_____

_____

_____

_____

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B. Ranking Instructions: Rank the distance (from greatest to least) the comet traveled during each of the segments (A – D) of the orbit.

Ranking Order: Greatest 1 _____ 2 _____ 3 _____ 4 _____ Least

Or, the distance traveled during each segment would be the same. _____ (indicate with check mark).

Carefully explain your reasoning for ranking this way:

_____
_____
_____
_____

C. Ranking Instructions: Rank the speed (from slowest to fastest) of the comet during each segment (A – D) of the orbit.

Ranking Order: Slowest 1 _____ 2 _____ 3 _____ 4 _____ Fastest

Or, the speed of the comet during each of the segments would be the same. _____ (indicate with check mark).

Carefully explain your reasoning for ranking this way:

_____
_____
_____
_____

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