Linear vs. Angular Velocity Lab

We're certainly all familiar with the ubiquitous CD player's operation. However, very few people know much more than how to turn one on and off and insert a disk. One day, while looking at a spinning CD through a clear top, it struck me that it was moving a lot faster than records do.

The information below came off an Internet site.

The layout of the CD is shown in the diagram, including the Lead-in, Program & Lead-out areas with their start and end radii and other dimensions.

CD's measure 12cm in diameter with a 15mm diameter center hole. The audio or computer data is stored from radius 25mm (after the lead-in) to radius 58mm maximum where the lead-out starts.

All audio CD’s are played at a constant linear velocity (CLV) of \( x \) miles per hour.

The angular velocity (\( \frac{65}{6} \text{ rads/sec} \)) will reduce from the lead-in to the lead-out by a factor of \( \frac{58}{23} = 2.52 \). This means that pits retain the same geometry wherever they are on the disc and there will be no change in performance across the disc.

1. Find the linear speed of a point on the outside of the disk, in miles per hour.

2. What are the fastest moving points on the disk? Why?

3. Is there any point on the disk that is not moving?

4. Is there a slowest moving point? Explain

5. Is the disk moving at a constant speed? Explain
The layout of a CD is shown in the diagram at right, including the Lead-in, Program & Lead-out areas with their start and end radii and other dimensions.

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