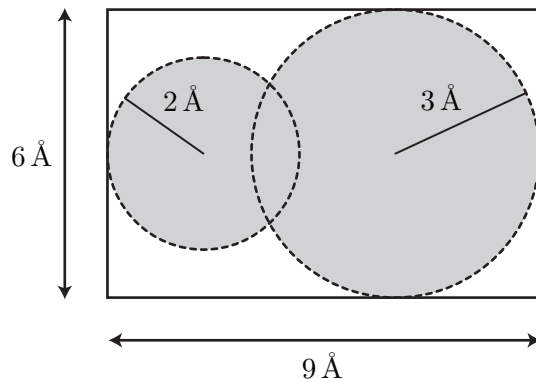


5. A diatomic molecule—modelled as two overlapping spheres located at $(2, 0)$ and $(6, 0)$ —is shown in profile below.



Compute its cross-sectional area as follows:

- Set two integer counters C and N to zero.
- Choose two random numbers $x \in [0, 9]$ and $y \in [-3, 3]$.
- If the point (x, y) lies within either of the atomic circumferences then increment C by one.
- Increment N by one.
- Repeat from (b) until N numbers in the tens of millions.
- Report the result $54 \times C \div N$, determined as a double-precision floating-point calculation.

You should be able to verify that the answer is 35.46 when the larger atom is relocated to $(5, 0)$; and 31.52 at $(4, 0)$. What's the value when the atom is in its original position, $(6, 0)$?

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