Probability Summary

If \( a \leq x_1 < x_2 \leq b \) and we pick \( x \) at random between \( a \) and \( b \), then:

\[
P(x_1 < x < x_2) = \frac{\int_{x_1}^{x_2} w(x) \, dx}{\int_{a}^{b} w(x) \, dx} = \frac{\text{Part}}{\text{Whole}}.
\]

In our previous example, the weighting function described the height of a curve above the \( x \)-axis.

Our next probability problem will be more realistic. Suppose you’re throwing darts at a dart board and your little brother is standing next to the dart board. How likely are you to hit your little brother?