Financial Mathematics
Planimeters
A mis-designed planimeter has its wheel at 45° to the second leg, rather than perpendicular. (See the next slide for a diagram, and note that the legs both have length 5, not 10.) Recompute the form \( \omega \) that describes the rate of turning of the wheel, following this new (erroneous) design.

Let \( C \) be the circle of radius 10 about the fixed pin, with the parametrization that completes one revolution around \( C \) at a constant speed of \( 20\pi \).

Compute \( \int_C \omega \).
How can we find the area enclosed?