Floor protractor for the wheel-flop lab (700c wheels)

Six sheets, US letter, tiled 3 across (A, B, C) by 2 down (1, 2). Print all pages at **100 %** ("actual size", not "fit to page"); check the 100 mm bar on tile B2.

1. Lay the tiles out A1 B1 C1 over A2 B2 C2. Each tile carries a shaded 10 mm overlap strip on its right and bottom edges. Place the next tile to the right, and the tile below, so that their registration crosses sit on the dashed lines of this tile (the shaded strips lie underneath).

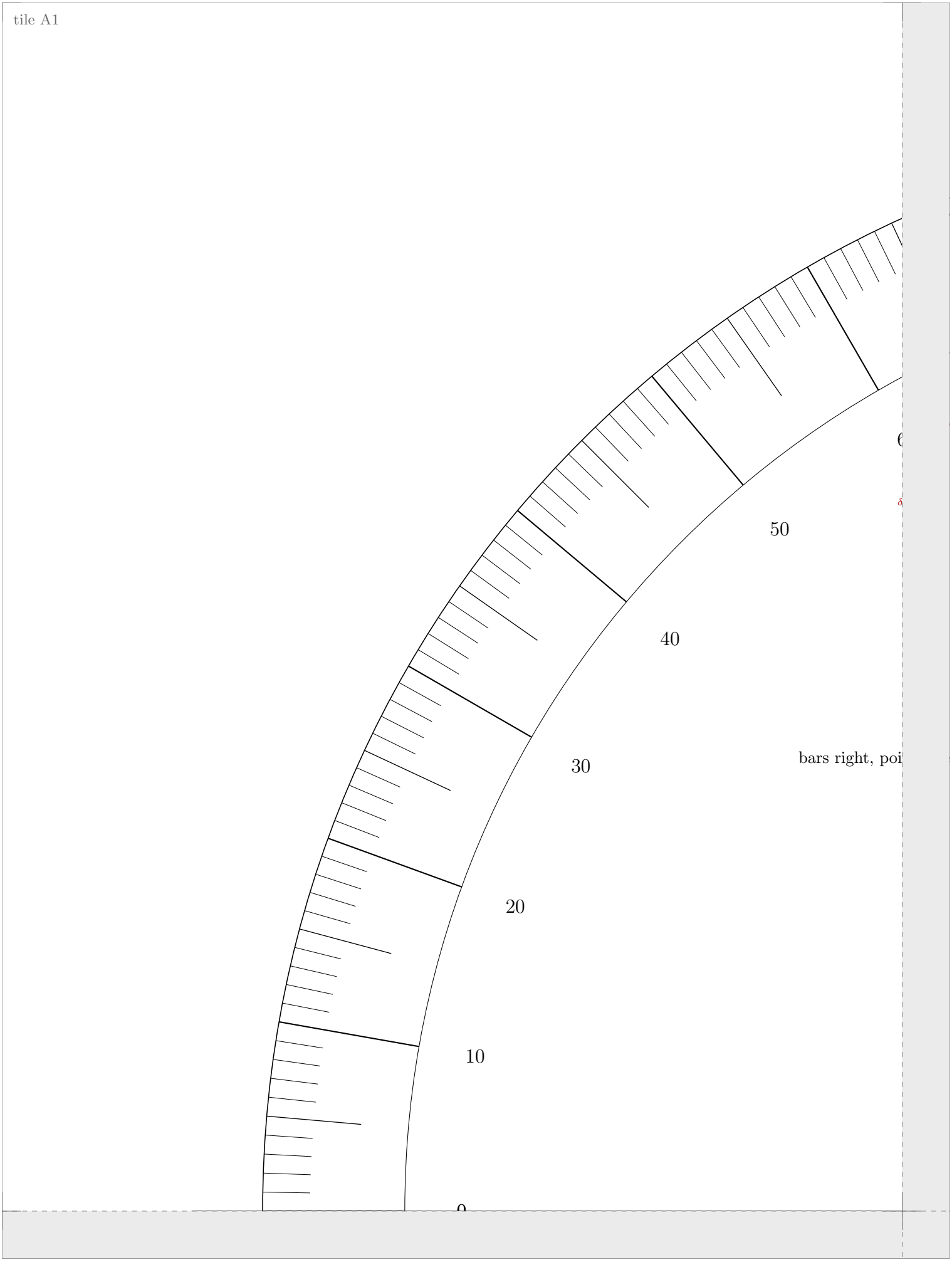
2. Tape the joints, then cut around the outer circle if you like; the centre cross P and the 0–0 line are what matter.

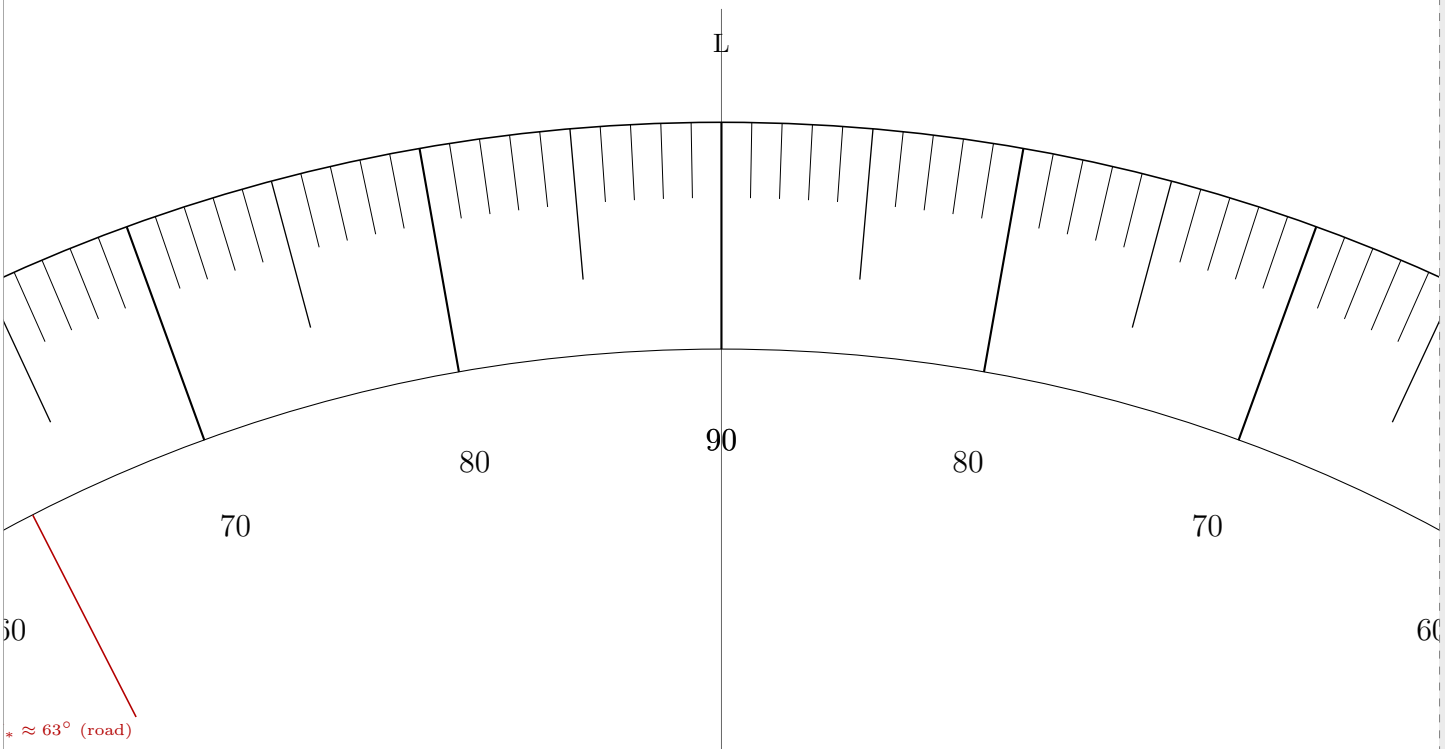
3. On the floor, mark the two tire contact points and draw the bicycle centreline through them. Mark P on that line a distance τ (the trail) ahead of the front contact G. Tape the sheet down with its centre on P and its 0–0 line on the centreline, "front" toward the front wheel.

4. The reading ring is 230 mm from P; on a 700c wheel a pointer tip at the ring, behind the wheel, has about 45 mm of clearance under the tire. Fix the pointer (a straightened paper clip or a strip of stiff card) to the back of the fork crown so that its tip is a few millimetres above the paper and lies on the 0 mark at $\delta = 0$. Read δ from the ring; the four quadrants are labelled for a pointer that points forward or rearward and bars turned left or right.

The small red marks on the rear half are the flop angle $\delta_* \approx 63^\circ$ for the road geometry ($\alpha = 73^\circ$, $R = 340$ mm, $\rho = 14$ mm, $o = 45$ mm); other geometries differ. The trail scale along the 0 line behind P shows where G sits for τ between 30 and 80 mm.

tile A1



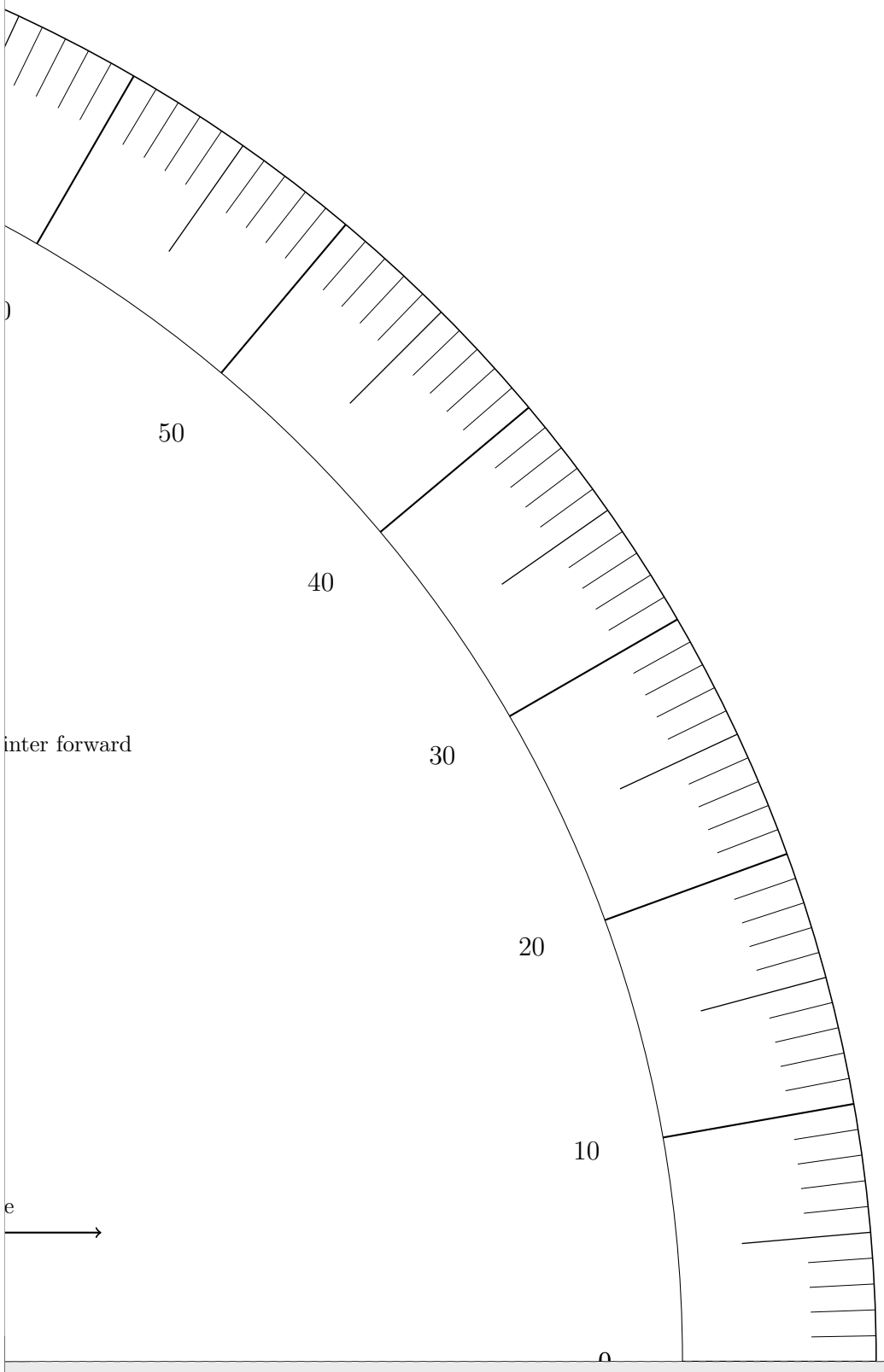


nter rearward

bars left, po

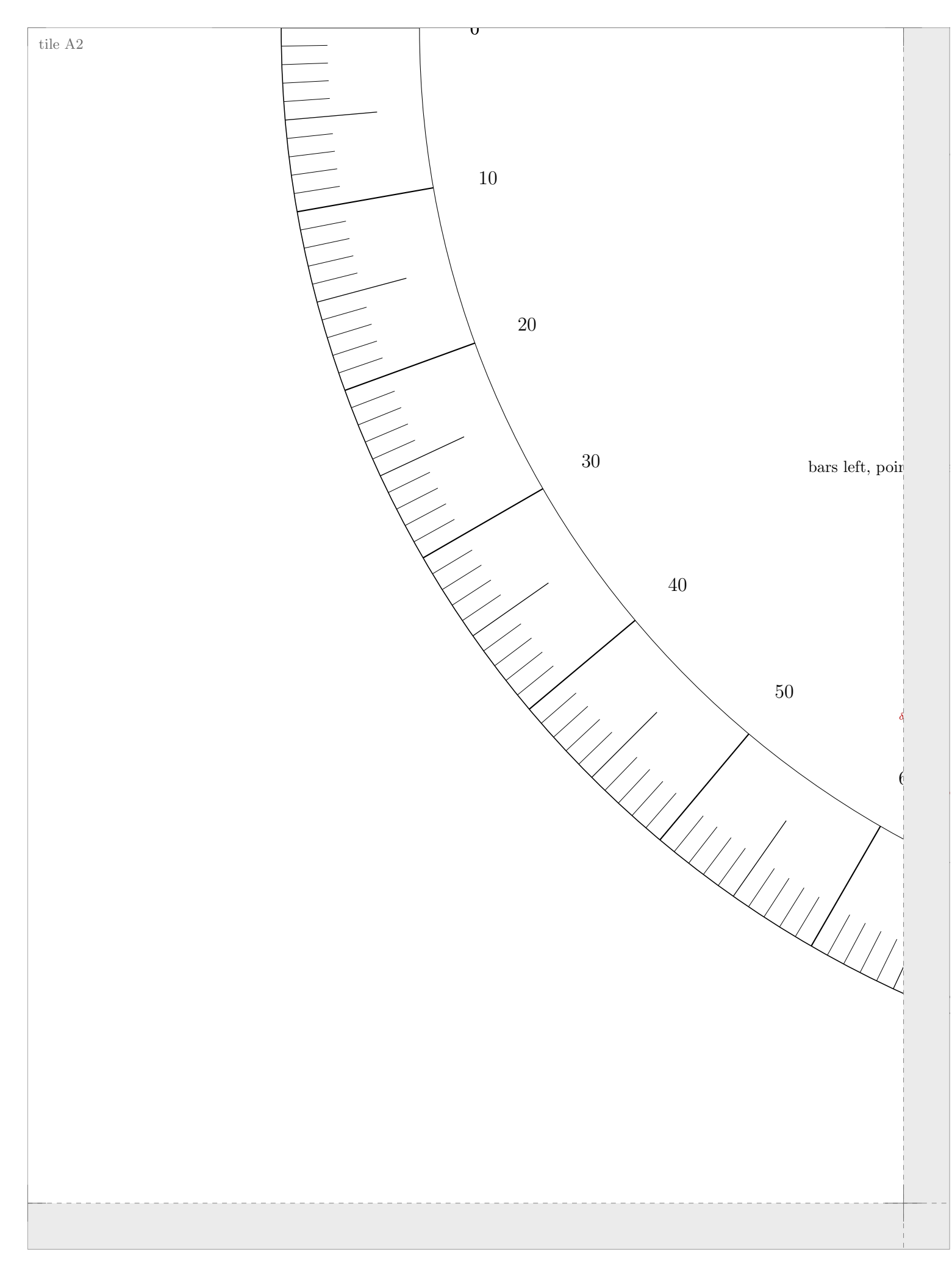
front of bicycl

P (steer axis meets floor)

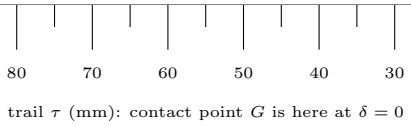


inter forward

e


0
10
20
30
40
50
bars left, poin

tile B2



trail τ (mm): contact point G is here at $\delta = 0$

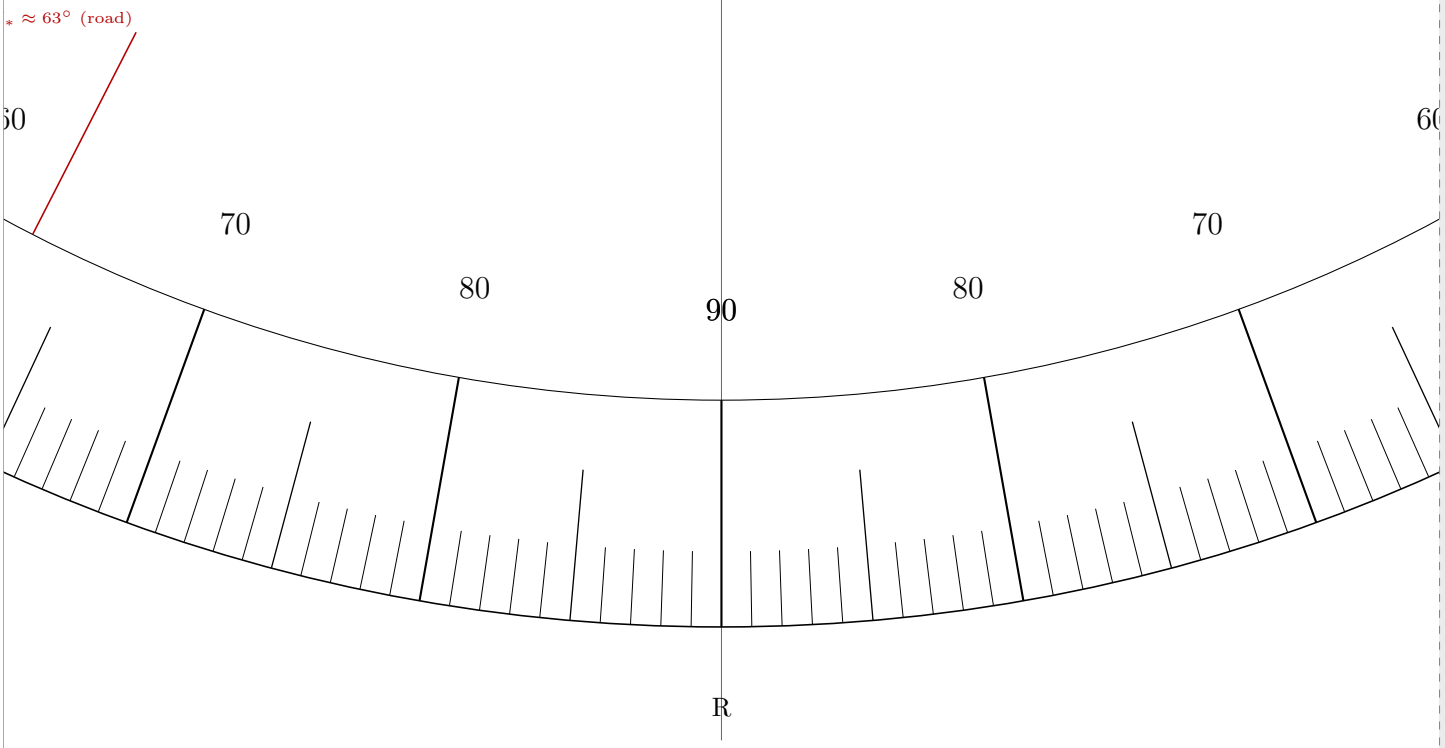
rear

ıter rearward

bars right, pc

this bar must measure 100 mm; if not, reprint at 100% scale

Wheel-flop lab floor protractor, 700c (R = 340 mm): centre on P, 0–0 line along the bicycle centreline



tile C2

