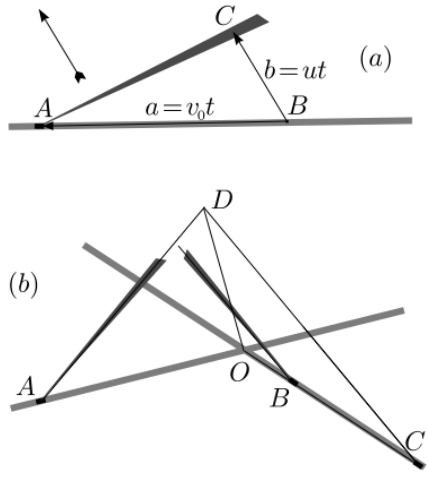
3. Tractor (6 points)



1) Let us draw from an arbitrary point B on the road a line parallel to the direction of the wind, and let it intersect the smoke trail at point C. Then, the smoke emitted by the tractor at B has travelled the distance $|BC| = ut$, where u is the wind speed. Tractor itself has travelled the distance $|AB| = v_0 t$. So, we can measure the distances $|AB|$ and $|BC|$ from the figure and calculate

$$u = v_0 \frac{|BC|}{|AC|} = \frac{18\,\text{mm}}{42\,\text{mm}}\, 30\,\text{km/h} \approx 13\,\text{km/h}.$$

2) If the second tractor (at the right-hand-side) had started somewhat earlier, the two tractors had been at the crossroad simultaneously. Now, the tractors would be at the same distance from the crossroad, i.e. for the current position of the second tractor C, $|OC| = |AO| = v_0 t$ (this is how we find the point C). Its smoke trail can be found as a line, parallel to its smoke trail at its actual position B. Such a meeting of the tractors would have been resulted in the crossing of the smoke trails. which would be now in position D, with $OD = ut$. So, we find

$$u = v_0 \frac{|OD|}{|AO|} = \frac{27\,\text{mm}}{39\,\text{mm}}\, 30\,\text{km/h} \approx 21\,\text{km/h}.$$